WHEAT FIELDS

AND

MARKETS OF THE WORLD

ROLLIN E. SMITH

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WHEAT FIELDS AND MARKETS OF THE WORLD

BY

ROLLIN E. SMITH
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PREFACE.

WHATEVER may be the criticisms on this book, it cannot justly be said that the work was begun hurriedly or without an attempt, at least, at preparation and an understanding of the subject. It is now eight years since the thought developed into a fixed determination sometime to write a book on wheat. During the intervening time the author has been constantly in touch with the markets, and therefore with crop conditions, and has in addition taken advantage of certain opportunities—and made others—to travel in the Western wheat states and in the Canadian West when the crops were growing, to learn from observation what can be learned in no other way. In 1906 he visited all the important grain exchanges in Europe and traveled through all the wheat-growing countries, with the purpose of finally putting the material gathered into book form. But for unforeseen circumstances this would have been done a year earlier. However, the year 1907 was such an eventful one in the world's wheat supply-and-demand situation and in the markets, that this work should be of more value, as a record at least, for the delay. Whether "Wheat Fields and Markets of the

World" justifies the time and labor and expense devoted to its preparation, the reader will, of course, decide for himself.

While the title is rather comprehensive, the author does not wish to convey the impression that he believes the subject has been exhausted in this volume. Quite the contrary is the case; and one of the difficulties that continually confronted him was to decide what to leave out, rather than what to include—just how far to go in the "Wheat Fields" without drifting too far into agriculture; and how far to venture in the "Markets" without inadvertently leading the reader into speculation. Then, too, there are statistics and the methods of grain handling and milling, all of which are touched upon lightly. And yet, another 400 pages might be written on these phases of the subject; another volume on wheat-growing, and still another on speculators and speculation, corners and manipulation. But realizing the vastness of his theme, the author has taken the thought of wheat in its commercial importance mainly, as an imaginary rope on which to hold, to keep from drifting too far in any one direction.

Yet he feels impelled to refer here, very briefly, to grain inspection, a matter that has caused no little agitation in the grain trade of several states. Because of the technical nature of grain inspection, no space is given to it in this work. Federal inspection is urged by some, as a remedy for certain evils known, and for others imagined, to exist under state or grain exchange inspection. Dur-

ing the winter of 1907-08, when grain-inspection bills were before Congress, the Chicago Board of Trade went on record as opposing federal inspection; the St. Louis Merchants' Exchange as favoring it, while the Minneapolis Chamber of Commerce took no action. After some study of the matter in the importing countries of Europe, and with some knowledge of inspection in the United States and Canada, the author has come to be a firm believer in federal grain inspection.

In a work of this kind it will, of course, be taken for granted that credit is due many authorities for sympathetic encouragement and assistance in collecting material. Besides writers, statisticians and publications to whom credit is given in the text, where quotations are used, the author is under obligations, for courtesies received, to many persons in the grain trade, in milling and in banking circles in America, Canada and Europe; also, government and state officials have, without exception, courteously responded to requests for statistical information. To all these, and particularly to Mr. G. J. S. Broomhall, statistician, of Liverpool, sincere acknowledgment is made.

—R. E. S.

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PART I.

WHEAT FIELDS

AND

MARKETS OF THE WORLD.

CHAPTER I.

WHEAT IN THE WORLD'S COMMERCE.

Crop Movement Keeps Money Circulating—Draws Currency Away from the Centers—A Trade Stimulus—Natural Tendency of Currency in America Is Toward New York—Trend of World's Gold Toward the Great Centers—Almost Three Billion Bushels of Wheat Annually Marketed and Consumed — Number of Bread-Eaters Increasing — Per Capita Consumption—America's Agricultural and Commercial Greatness Largely Due to Wheat.

IN DEVELOPING the resources of the earth and preparing places for the world's expanding millions, commerce claims the most prominent place; for this is a commercial age. Yet if one were asked to name the two greatest of the earth's products necessary to advancing civilization, perhaps he would say that he could not. If asked to name three, he would probably say, wheat, iron and gold. All others are subservient to these and wait upon them. Gold is the necessary basis for a monetary system the world over. Iron is the basis for all building and transportation, without which the development of new countries would be impossible. Wheat is not only an agricultural foundation and the most important foodstuff of the Caucasian races, but it has a particular province

and one of almost incalculable importance in the great system of commerce. That is, in the marketing of wheat by the farmer, the movement to the great centers and to the world's markets, in the form of grain or flour, money—gold or currency—is kept in motion, continually circulating, giving life to trade, and making new enterprises and the development of new lands possible. Stop the circulation of currency, and all business is at once depressed, as was forcefully demonstrated in the fall of 1907, when the banks in all the cities of the United States ceased paying out currency except in very small amounts.

The natural tendency of currency in the United States is toward New York, and without the constantly recurring wheat crop, assisted by other grains and cotton, artificial means would be required to keep the country's supply of currency from accumulating in the great Eastern money center, and so reducing the small towns and agricultural districts to primitive barter.

Just as the tendency of currency is toward New York, the trend of gold throughout the world is toward the great banking centers of London, Paris and Berlin. And artificial means, such as advancing the rates of interest and of exchange, are used to keep the gold there to as great an extent as the balance of trade will permit.

While wheat, other grains and cotton in the United States are the most influential factors in drawing money back from the centers, wheat and rye serve the same purpose in Europe. But taking the world as a whole, excepting the Orient, wheat is the greatest distributor of money, ceaselessly drawing the gold—or balance of trade, which amounts to the same thing—from the money centers to the countries of wheat fields. Wheat goes from America and Canada, Argentina, Australia, India, Russia and southeastern Europe in a continuous stream,

as if on one of its own conveyor-belts, to London, Liverpool, Antwerp, Rotterdam and Hamburg, and gold flows back; and thus the commerce of the world is maintained. The flow of wheat is like a stream fed by a gushing spring; for a new crop is continually coming out of the ground, and is urged forward to follow the last one, which has already vanished. Consumption is making way for a new crop.

Yet human food is the chief end of wheat, and the bread-eating countries now consume something like three billion bushels annually, while the importing countries buy of the exporters 500,000,000 bushels every year. Since 1901 the world's consumption of wheat, including wastefulness during cheap prices, has increased approximately 100,000,000 bushels a year; yet the increase is the result of more bread-eaters rather than a greater per capita consumption.

While there is an increasing tendency in the amount of wheat per capita consumed in some countries, this does not appear to be true of America and the United Kingdom. Some estimates to the contrary, showing a large increase per capita in the United States, may be questioned. For, owing to a considerable percentage of the crop for several reasons being of poor quality, a large amount was fed to livestock, and this has doubtless been included in the consumption as human food.

In some countries where there has been a decided increased per capita consumption, the conditions are radically different from those in America and the United Kingdom. In Germany and Russia, where the food of the agricultural and working classes is largely rye, and in southeastern Europe, where rye and Indian corn are largely used, any change toward more luxurious diet would include white bread first. In America and the

United Kingdom, however, where the standard of living is higher, the first indication of increasing prosperity is not in the greater consumption of white bread, but of a mixed diet—more meat, poultry, eggs, fish and fruit. This has been so marked in the United Kingdom during the last ten years as to cause radical changes in certain lines of business.

Contrary to what seems to be rather a general opinion, the United States and the United Kingdom are the smallest consumers of wheat per capita of the bread-eating countries. In the United States this is in some degree due to the large use of corn in the southern states. The per capita consumption of wheat and rye by the four leading nations was, in 1903, as follows:

	Wheat Lbs.	Rye Lbs.	Wheat and Rye Lbs.
United States.....	275	20	295
United Kingdom.....	350	6	356
Germany	200	325	525
France	473	77	550

While the statistics of meat consumption are not available, the amount paid for meat, poultry, fish, eggs, milk, butter and cheese, is much greater in the United States and Great Britain than in Germany and France.

The rapidly increasing population in America steadily calls for a greater amount of wheat each year. Domestic requirements are approximately 500,000,000 bushels, which includes bread and seed and possibly a small amount of low-grade stuff used for feed. The amount used varies somewhat, due to the price and the cost of other foodstuffs.

While the amount of wheat consumed in the world may vary 200,000,000 bushels from one year to another this is not because of lack of demand. The demand is more constant than the supply; but the matter of the

varying supply is given a chapter by itself under the head of crop calamities.

It is not difficult to trace a large part of America's agricultural and commercial greatness directly to wheat; for this grain is the pioneer, making it possible for the farmer to exist while he lays the foundation for substantial and permanent diversified agriculture. Wheat pushed on westward with the frontiersman from the Alleghenies, through the central states, swelling in proportion as it went; but leaving behind, prosperous farming communities, towns and embryo jobbing centers. Onward to the Missouri river, and then toward western Kansas and Oklahoma, in the Southwest, and, within the last five years, even into the Bad Lands of North Dakota, in the Northwest. The Pacific Northwest has grown rich from wheat during the last few years, and in the Canadian West or Northwest wheat is rushing onward like an invading army; but leaving, as it goes, instead of wreck, the beginning of another agricultural empire, a field for the output of thousands of factories.

Yet the march of wheat and the development of agriculture, with the resulting towns and cities, is not confined to North America. It is doing for Argentina what it has done for America and is now doing for Canada. Australia is also being developed in regions where, without wheat, the lands might lie idle for many more generations.

The history of the new agricultural countries is that wheat leads railroad building as well as commerce. The rapid development of the Northwestern states and the Canadian West during the last five years, a development which is little understood except by those who have seen it, was largely due to the ability of railroad construction to keep well upon the heel of settlement,

Settlers have not hesitated to go back 30 or 40 miles from existing lines of railroad, feeling confident that within two or three years a branch line would be built in their direction. It seems reasonable to believe that if railroad construction were pushed with half the energy in Argentina that it has been in the Canadian West, the grain trade of the world would be on a somewhat different basis.

Probably more general interest attaches to wheat during its course of evolution from the raw material on the farm to the manufactured article than to any other product of the earth. This is only partly due to the magnitude of the crops and to its general use. The practice of marketing millions of bushels within six to eight weeks after harvest, and of storing millions of bushels at the elevator centers and at country stations; the immense amount of money required to move the crops, and the fact that great central trading centers, called grain exchanges, have developed, where wheat is bought and sold in unlimited quantities and for months in advance—these features have given a sentimental interest to wheat. The crop, whether good or bad, is an influential factor in the stock market; for dividends of railroads and industrials are affected favorably or unfavorably. Likewise, the crops are watched with the greatest of interest by jobbers and manufacturers; and the crop-moving season is now looked forward to almost with apprehension in the money centers, because of the effect it will have on the supply of currency. Banks in the agricultural states begin months ahead to prepare for the annual distribution of millions of dollars to the farmers. Also, the railroad companies, the steamboat lines on the Great Lakes and the steamship lines from all the wheat exporting countries of the world prepare to do their part in moving the crops to market.

CHAPTER II.

EXPORTING AND IMPORTING COUNTRIES.

Distribution of the World's Crop—The Various Countries and Their Crops—Exporting Countries—Importing Countries—Surpluses and Requirements—Preliminary Estimates—Price Basis—All Information Centers in London and Liverpool—Weekly Requirements of Importing Countries—World's Shipments Recorded—Wheat on Ocean Passage—Immense Fleet of Grain Vessels—World's Visible Supply—Surplus Accounted For—Worldwide Book-keeping.

A GENERAL basis for the world's wheat trade each year is formed by the estimates of the size of the crop in the various countries; the known (approximate) requirements of the bread-eating countries, and the distribution of the crops. Some countries will have full crops and others poor ones in the same season. A short crop or a large one in certain countries has greater influence in the markets of the world than the same surplus or shortage in certain other countries would have because of the greater availability for general distribution.

In 1906 the world raised the greatest wheat crop ever harvested, and the figures for that year will be used in showing the wide distribution of wheat growing. In passing it may be said that this record crop was practically all consumed and that no great surplus, unless in farmers' bins, was carried over to the next season. It is therefore apparent that the world has reached a point of extraordinary wheat consumption, when the price is low. The fact that the crop of 1907 was estimated at some 400,000,000 bushels less, illustrates the elasticity

of the diet of the bread-eating people. If wheat is abundant and cheap, there may be 300,000,000 bushels more consumed than when there is some scarcity and prices are correspondingly high. And yet the world suffers no hardship nor great inconvenience by the shrinkage in wheat supplies.

In the record year of 1906 the world raised 3,423,700,000 bushels of wheat. The greater divisions of the wheat-growing area are the continents, for wheat is grown in them all. Divided thus, in 1906, the distribution of the crop was as follows:

	Bushels.
North America	871,875,000
South America	155,337,000
Europe	1,825,608,000
Asia	444,782,000
Africa	48,404,000
Australasia	77,694,000
Total	3,423,700,000

A division of the continents shows the wheat-growing countries to have raised the following amounts, respectively:

North America.	
United States	735,261,000
Canada	131,614,000
Mexico	5,000,000

South America.	
Argentina	134,931,000
Chili	15,800,000
Uruguay	4,606,000

Africa.	
Algeria	28,000,000
Anglo-Egypt	400,000
Cape of Good Hope	2,000,000
Egypt	12,000,000
Natal	4,000
Tunis	6,000,000

Australasia.	
Australia	70,681,000
New Zealand	7,013,000

Europe.	
Austria-Hungary	268,574,000
Belgium	13,000
Bulgaria	55,076,000
Denmark	4,400,000
Finland	130,000
France	324,725,000
Germany	144,754,000
Greece	8,000,000
Italy	168,000,000
Montenegro	200,000
Netherlands	4,700,000
Norway	300,000
Portugal	8,000,000
Roumania	113,867,000
Russia	450,000,000
Servia	13,211,000
Spain	154,090,000
Sweden	6,227,000
Switzerland	4,000,000
Turkey in Europe	22,000,000
United Kingdom	62,354,000

Asia.	
British India	319,582,000
Cyprus	2,000,000
Japan	18,000,000
Formosa	200,000
Persia	16,000,000
Central Asia	21,000,000
Siberia	35,000,000
Turkey in Asia	33,000,000

These are the final estimates by the various governments and statisticians. Of course, it cannot be said that they are more than approximately correct, for there is no way of arriving at absolute figures. The final estimates always stand as records for the trade, however, for there is no means of going back of them.

Yet it is the estimates before harvest that are the most important in one sense, for upon them the markets of the world gain their first information regarding probable supplies for the ensuing year.

But there is still another division to be made of the wheat-growing countries before one is enabled to take a comprehensive, commercial view of the whole. The third division separates the countries into the exporting and the importing. All countries that raise wheat also eat bread. Some of them raise more than enough for their requirements, some not quite enough; while others,

as the United Kingdom, Germany and the Netherlands, are compelled to draw heavily upon others for a large part of their supplies. Distributing the world's crop every year is somewhat like pouring water upon an uneven surface. All the surface becomes even after a time, yet the water is thinner in some places than in others. Distributing the wheat crop first to different parts of the wheat-growing countries, and then to the importing countries, creates an important part of the commerce of the world. It keeps railroad and steamship lines busy, furnishes employment for many thousands of men, draws money from the centers to the agricultural districts and annually brings renewed wealth to the farmers of many countries—yet, alas! not to those of Russia or Roumania.

The world is divided into exporting and importing countries, as follows:

EXPORTING.—	IMPORTING—
United States	United Kingdom
Canada	Germany
Russia	France
*Balkan States	Belgium
India	Holland
Argentina	Italy
Australia	Switzerland
Austria-Hungary	Spain
†"Others."	Portugal
	Sweden-Norway-Denmark
	Greece
	‡"Others."

* The Balkan states include Roumania, Bulgaria, Roumalia and Turkey-in-Europe. Shipments cleared from the mouth of the Danube are given weekly in the "world's shipments" as from the Danube. They include Balkan states' exports, excepting Turkey, and also some from the government of Bessarabia, Russia.

† "Others," in the weekly world's shipments, include North Africa, Asia but not Siberia, Chili, etc. Argentine exports include those from Uruguay, which are as yet unimportant.

‡ China, Brazil, South Africa, Mexico, West Indies, etc.

Of the exporting countries the United States has become a somewhat uncertain factor, due to increasing domestic requirements and irregular crops. It now takes a big crop to provide an important exportable surplus. When other countries have full crops, as in 1906, the importers do not take the United States into consideration until the crop of this country is assured. Then, if large, as it was in 1906, the surplus depresses the price of the crops of the entire world.

India, while never one of the great exporters, is important for two reasons. The crop is harvested in April, and there may be an exportable surplus of 80,000,000 bushels, or none at all.

Argentina is steadily growing in importance, and is now looked to as one of the regular sources of supply for 100,000,000 bushels or more. Furthermore, the crop is ready for export by February 1st, just at a time when supplies from other countries are falling off.

The great importers are the United Kingdom, Germany, Holland, Belgium and Italy.

As all the importing countries raise wheat, the home crop plays an important part in deciding the amount of imports required, except in Belgium and Holland, where the crops are small.

France occupies the peculiar position of being the third largest wheat-growing country in the world and yet being an unimportant factor in the world's markets, except during an occasional year. For France is either a small importer or a small exporter. The home crop is nicely balanced to the consumptive requirements of the country.

The United Kingdom, owing to its great population, small crop and immense imports, is, in the wheat world

of commerce, what the Bank of England is in the financial world. A diagnosis of the supply situation by the importers of London and Liverpool in the summer, about harvest time or somewhat earlier, establishes a price basis for the markets of the world. This foundation, however, is elastic and adapts itself to changing conditions as the harvest progresses; and a late crop movement or unfavorable weather in America, Canada or Russia may upset their calculations, either temporarily or altogether. Likewise a wet harvest in the United Kingdom or Germany will cause the native wheat to be unfit for use as early as usual, and so create a temporary demand for foreign wheat greater than expected.

So closely are the requirements of the importing countries known and so accurately are the surpluses of the exporting countries reckoned and the total of the crops estimated, and so wonderful are the transportation facilities and so perfect the system of marketing wheat, handling it and storing it, that London, the greatest cargo buyer, knows approximately on July 1st what countries' wheats will form its bread during the year, and about what those wheats will cost. Only an accident south of the equator or manipulation in Chicago will put them far wrong in their reckoning.

The world's wheat exports are 520,000,000 to 540,000,000 bushels annually, or approximately the requirements of the United States for bread, seed and to carry over.

The importing countries, of course, take this amount. Yet the amount they buy for import depends upon the price to some extent; for they will economize when prices are high.

Along toward the latter part of July, when the winter

wheat of America and Europe has been cut and the spring wheat is approaching harvest, the foodstuff statisticians of London and Liverpool will make a preliminary estimate of the prospective supplies from the exporting countries and of the probable requirements of the importing countries. They have, of course, kept closely in touch with crop conditions the world over, and some of them have their own correspondents in the principal grain-growing countries. Taking the known exports and imports of the season just closing as a basis, they make their preliminary estimate.

The result of an actual estimate of this kind by one of the foremost grain statisticians in the world is given herewith as an illustration—this was issued on August 1st; amounts in quarters, 8 bushels to the quarter:

PROSPECTIVE SUPPLIES.—Season August to July.

	Prospective for season 1907-08. Qrs.	Actual exports in season 1906-07. (52 weeks.) Qrs.
U. S. A.	15,000,000	18,600,000
Canada	4,000,000	5,100,000
Russia	15,000,000	11,600,000
Balkan States	5,000,000	9,600,000
Argentina	14,000,000	13,650,000
Australasia	4,500,000	3,700,000
India	4,000,000	3,700,000
Austria-Hungary	.....	700,000
Minor Countries	1,000,000	1,030,000
Total	62,500,000	67,680,000

REQUIREMENTS.

	Prospective for season 1907-08. Qrs.	Actual Imports 1906-07. Qrs.
U. K.	27,000,000	26,200,000
France	1,800,000	1,800,000
Germany	11,000,000	9,000,000
Holland, Belgium	8,500,000	8,800,000
Italy	5,000,000	5,500,000
Spain, Portugal	2,000,000	1,000,000
Scandinavia	2,000,000	2,000,000
Switzerland	2,300,000	2,300,000
Greece	600,000	600,000
Austria Hungary	1,500,000	.....
Total Continent	34,700,000	31,000,000
Total Europe	61,700,000	57,200,000
Ex-European	10,000,000	10,300,000
Total	71,700,000	67,500,000

It will be noticed that the probable requirements of the importing countries are 71,700,000 quarters, whereas the prospective supplies from the exporters are but 62,500,000. This is an extraordinary situation, and it clearly says to the world that prices will be at a high level throughout the crop year. The great importing houses of London, Liverpool, Antwerp, Amsterdam and Hamburg know that they cannot dictate prices to the sellers, the exporting countries.

Reverse this situation, however, and clearly show that the exporting countries easily have a surplus in excess of the probable requirements of the importing countries, and the great importing houses fix their ideas of the price level at a very low point. When they are sure of their position, they are the best waiters and the best buyers in the world. They get the world's surplus at their own figures; and then the American farmer wishes he had sown less wheat and raised more of something else.

Yet the preliminary estimates of prospective supplies and requirements need frequent revisions as final reports from the harvest fields are received. For instance, late in November, when the wheat movement was well under way, a remarkable thing was discovered. France, which on August 1st was placed among the importing countries, was found to have an exportable surplus of 20,000,000 bushels. The statisticians also discovered something else. That is, as a result of high prices, the world's requirements would probably be 50,000,000 bushels less than the August 1st estimate. The high prices were causing people to eat less bread.

Now let us for a moment imagine ourselves in the "Baltic" market, London (the Baltic Mercantile & Shipping Exchange), or on the Liverpool Exchange (the Liverpool Corn Trade Association). These markets are the centers for information from all parts of the world regarding wheat crops and supplies. In these markets we are in constant communication by cable with all the exporting countries. All crop information from whatever part of the world is directed toward these centers. We learn what the Chicago market opened at, what the weather is in the Western wheat states and how many

cars of wheat Minneapolis, Duluth and Winnipeg received this morning; we learn of crop and supply conditions in Argentina, whether it is raining or the sun shining, and whether grain is being offered freely or being held back; from Russia we learn the latest developments of the strike of the dock laborers at Odessa, of the stocks of wheat at all the Black Sea ports, and of the crop and other conditions; and from India we learn the latest drouth news, while Australia tells us of its crop and its exports.

Tomorrow me may come again, and again be placed in communication with every exporting country and even with every port of importance in the world. And so we may, every business day in the year, be at the center of all information of wheat crops and everything pertaining to them. Just as the spider is at the center of its world when in its web, so are we at the center of, and in constant communication with, the great wheat world when we are at the Baltic in London or the Grain Exchange of Liverpool.

But to know approximately the amount of the prospective supplies and requirements and the size of the European crops, is only a part of the great commercial game; this but lays the foundation. Knowing that the importing countries will be fed is not feeding them. They must have their usual weekly allowance; and the cables must say whether it is coming along regularly from the exporting countries. This is as important, commercially, as that it exists. The great importing houses of London, Liverpool, Antwerp, Amsterdam and Hamburg must constantly know the movements of cargoes of grain in every quarter of the world; and this information is daily arriving in Liverpool. It is gathered and the

statistics compiled by Mr. Broomhall, publisher of the Corn Trade News.

There is, of course, a continual stream of wheat coming over the oceans toward western Europe. Steamers are being unloaded every day at the great ports, while other steamers are being loaded at the many American and Russian ports and at Argentina and Australia as well. Yet by means of the perfect system of obtaining information, London and Liverpool know every Monday how much wheat is afloat throughout the world. The amount that is cleared from each port is cabled to Mr. Broomhall, while the amount unloaded at the ports of Europe is easily obtained. The amount of the world's shipments is added to the amount on ocean passage, while that which is unloaded is deducted. This is done every week, so that on Mondays the amount of the world's shipments and the amount on passage become matters of interest in every market in the world, and matters of decided importance in London and Liverpool. For, if the amount on passage decreases below the normal, it has a market effect, as much as a decrease in bank reserves in New York, as shown by the weekly bank statement, has. One reason for this is that speculators in Liverpool or London who have sold wheat that they have not yet bought—sold short, in fact—may become alarmed lest they cannot readily buy it to deliver on sales. They may therefore bid for wheat until they get it, but meanwhile they advance the price. It may be seen, therefore, that short selling is not confined to the pit in America, and that future trading as done in America is not necessary for speculating.

The weekly requirements of wheat and flour of the importing countries from other sources than their own

crops, range from 6,500,000 bushels in February and March to 8,000,000 in April and August and to 9,500,000 during the other months. Of course, these amounts are not exact, and they vary slightly from year to year.

The amount of wheat and flour on passage also fluctuates. It is heaviest in March, April and May, and lightest in December and January. The amount varies greatly in different years. The first week in January, for instance, for a series of years shows the following variations: 33,520,000 bushels, 22,472,000, 23,920,000, 30,960,000 and 28,672,000, respectively.

In May and June the amount increases to 45,000,000 to 50,000,000 bushels, and, in 1904, it increased to over 53,000,000.

This vast tonnage continuously afloat of course means a great number of vessels constantly employed in the wheat and flour trade. While, of course, vessels carry other freight at the same time, the amount of space given up to wheat and flour represents 300 steamships carrying 100,000 bushels each during the winter months, and 400 to 500 steamships in the spring and early summer. That is, if every grain vessel carried a cargo of 100,000 bushels, it would require a fleet of 300 to 500 steamships the year round to carry the world's surplus wheat to the importing countries. Some vessels carry from 200,000 to 325,000 bushels of wheat, but these are big cargoes and far above the average.

The amount of wheat on ocean passage is divided into that for the United Kingdom and that for the continent. By far the greater part is billed to the United Kingdom, though some is "for orders" and may be diverted to continental ports.

Still another item in the world's statistics is the

available supply of breadstuffs, wheat and flour. That is, "the world's visible supply," or the stocks in store at central points.

The amount in store, or "the visible supply," in America and Canada is compiled in the United States and is published weekly. The world's increase or decrease is estimated and published weekly, while the total world's supply, in detail, is published monthly.

The items in this statement are, The amount of wheat, and flour estimated as wheat, afloat for the United Kingdom; afloat for the continent, afloat "for orders"; the amount in store in the United Kingdom, in France, in Belgium, Holland and Germany, in Russia, in other centers of Europe, in Argentina and in Australia. These amounts added to the visible supply in America and Canada form the "world's available supply", or, "the world's visible."

The average supply on August 1st is 120,000,000 bushels. During the last ten years the world's visible supply on January 1st has ranged as follows: 157,000,000, 147,200,000, 208,600,000, 214,800,000, 208,600,000, 175,500,000, 178,300,000, 189,200,000, 205,900,000 and 220,400,000, respectively.

The accuracy with which the book-keeping for the exporting and the importing countries is done will be realized when the following tables are examined. They cover a season's business, from August 1st to July 31st. One table shows the amount of wheat, and flour computed as wheat, exported from the various countries, while the other shows the countries receiving it and the respective amounts received. Perhaps nothing else could convey such a clear idea of the marvelous system of

handling the surplus from the world's wheat crop. The tables follow giving the amounts in bushels:

Exported from—	
U. S. and Canada....	140,896,000
Russia	154,904,000
Balkan States.....	76,648,000
India	25,648,000
Argen. and Uru.....	104,528,000
Australasia	30,104,000
Austria-Hungary	1,408,000
Chili, North Africa, Persia, Turkey in Asia, etc.....	2,576,000
Total	536,712,000

Received by—	
United Kingdom.....	205,712,000
France	15,712,000
Belgium	64,224,000
Holland	62,096,000
Germany	23,496,000
Italy	45,848,000
Spain	25,888,000
Portugal	2,912,000
Greece	5,864,000
Scandinavia, etc.....	13,656,000
Austria-Hungary	536,000
N. Africa and Malta.	1,272,000
Ex-European	69,496,000
Total	536,712,000

CHAPTER III.

RUSSIA.

The Great Unknown—At the Bottom in Agriculture—Cheap Labor but Not Cheap Production—Crop Information—Grain Trade Ignorant of Its Value—News Comes from Many Sources—Percentage of Russian Wheat Used by Western Europe—Russian Grain Exports—Total Wheat Area—Bread and Seed Requirements—Export Possibilities—Wheat Area—Black Soil Belt—Topography—Wheat-Growing "Regions"—Wheat Acreage, Spring and Winter—Yield Per Acre.

RUSSIA, a country for which Nature has done so much and man so little, is regarded in the grain trade as the Great Unknown. This is because calculations have so often been upset by developments. For, some seasons, when it has been certain that a good crop was raised, disappointingly small exports have followed; and sometimes, after a small harvest, the exports have surprised every one. Then too, crop reports from Russia are always received with skepticism, for the reason that people have formed the habit of thinking that no news from that country can be relied upon. Nor can it be understood by many people how it is that peasants will be starving—that famine actually exists in parts of the great empire while grain shipments are heavy from the seaports. To use an expression of the pit, people "get whipsawed" in following their convictions regarding the truth of reports from Russia. Some will say, With the exports so heavy, it is impossible that peasants can be starving; for surely the country would feed its own people before sending grain to western Europe. Others will

reason conversely. They will say, If there is famine in parts of Russia, the exportation of grain will soon cease, for surely the country will feed its own people.

Yet the reasoning of each is wrong, for there is famine in some part of Russia almost every winter, and it is seldom that grain is turned backward from, or near to, the seaboard to feed a few thousand starving peasants. It is because of the vastness of Russia and the indifference of those who might alleviate the distress of those who lose their crops that such things are possible. It is also the vastness of Russia and the inability of the disaffected to readily communicate or get together, that makes possible the continuance of the government. If Russia were no larger than France, what once happened in France would long ere this have happened in Russia. But until education and enlightenment lift the peasants above the blight of official indifference, they will continue to starve and perish in parts of the country after a local crop failure, while grain is being exported in millions from the more fortunate governments.

Russia stands at the very bottom in agriculture, although being second in wheat raising only to the United States. The country is the greatest exporter of grain (not of wheat alone) in the world; yet the grain goes out as raw material and not as manufactured products. Russia is merely a grower of raw material for other countries; and so poorly cultivated are the fields of the peasants that the yield per acre of wheat is the lowest in the world. This, of course, raises the average cost of production per bushel to a relatively high level. Despite the fact that laborers can be hired at harvest-time for 30 to 40 cents a day, and women for little more than half that amount, the average cost per bushel of raising

wheat is as great as in North Dakota. If the same great area that is now annually seeded to wheat by the peasants should be cultivated even but slightly better, the result would be such an additional pouring of grain into the markets of Europe that trade would be demoralized. It would temporarily affect commerce just as the discovery of a method to make gold would affect finance. Agricultural development can only come slowly in Russia, however, and doubtless the world's consumption of wheat will gradually develop with it.

But regarding the lack of reliable crop information from Russia, and of statistical information as well, the writer is convinced that it is seemingly unreliable rather than actually so. As already suggested, people have acquired the habit of doubting all news from Russia; they do not know what to believe nor can they tell the value of reports. For this reason it often happens that sensational crop news though true has no effect on the markets. Yet during the last two or three years the crop reports and statistical news have been as accurate, in a general way, as from any country. In June of 1906 the writer traveled across southern Russia, from Bessarabia, in the extreme southwest, to Trans-Caucasia, in Asiatic Russia. During the trip he saw the effects of extreme drouth in the Don River country, where the crops were drying up. There were indications of almost complete crop failure over a vast area of the great spring wheat region. This was reported, and later it was confirmed by others. Yet members of the grain trade generally were indifferent. And during the early autumn, when wheat was being exported freely from southwestern Russia, where a good crop was raised, the reported crop failure in the east was forgotten or disbelieved—because

"there is no reliable information from Russia." But during the winter, reports of famine over a vast area became so persistent, and the absence of exports from eastern Russia so convincing, that even the most skeptical acknowledged that it is not impossible to "know" what is happening in that country.

Doubtless another reason for the skepticism regarding crop information is that there is no one in the country who is accepted as an authority. Most information now comes through representatives of European grain and commercial houses, and reports seldom cover more than one locality. Then, too, such information is private property, and details are lacking when it is made public. There are no Russian trade papers that make a business of collecting grain data, as there are in America, England and France. The Russian Government issues reports, but they are published long after things have happened rather than when they are happening. But as the official reports on area in grain, yield per acre and total grain raised have gradually included governments (states or provinces) not previously reported on, comparisons have caused confusion. For instance, up to twenty years ago the actual official reports were made up from fifty governments of European Russia only, whereas now they include seventy-two governments covering the whole of the Russian empire.

In a normal season, or crop year, Russia furnishes the importing countries of Europe approximately 30 per cent. of their imported wheat, 50 to 60 per cent. of their imports of barley, 75 per cent. of their oats, and 80 per cent. of their rye. The total exports of grain during a season of normal crops amount to approximately 350,000,000 bushels. The United States has exported over

500,000,000 bushels, more than 200,000,000 of which was corn, but has fallen off 50 per cent. in its exports.

Russian exports of wheat have, during the last ten years, been curtailed by crop failure during several seasons, but the tendency is toward an increasing amount. The acreage in wheat has increased materially, so that heavy exports are only a matter of favorable crop conditions.

The following table shows the wheat and flour exports, in bushels, from Russia and the United States during ten recent crop years:

Crop Year.	Russia.	America.
1906-7.....	92,000,000	92,154,000
1905-6.....	152,600,000	97,000,000
1904-5.....	182,300,000	48,000,000
1903-4.....	141,200,000	110,700,000
1902-3.....	134,000,000	202,400,000
1901-2.....	87,200,000	235,400,000
1900-1.....	76,800,000	224,800,000
1899-0.....	60,000,000	176,000,000
1898-9.....	69,000,000	210,400,000
1897-8.....	128,000,000	220,000,000

It is probable that Russia will gradually but surely lead America as a wheat exporting country, for the reason that domestic requirements are increasing rapidly in America. There has been a very steady increase in the wheat acreage of Russia, as the following table, compiled from the returns of the central statistical committee, shows:

Total area in wheat in the Russian empire at harvest—

	Acres.
1904	59,200,000
1903	57,200,000
1902	55,100,000
1901	54,300,000
1900	52,300,000
1899	49,740,000
1898	47,000,000
1897	46,730,000
1896	45,870,000
1895	42,230,000
1894	41,600,000

A normal crop for Russia is about the same as for America, or 600,000,000 to 650,000,000 bushels. The following table shows the variation in crops in Russia during recent years, due to unfavorable weather, amounts in bushels:

	1906.	1905	1904.
Wheat	533,000,000	584,000,000	663,000,000
Rye	682,000,000	712,000,000	1,008,000,000
Barley	276,000,000	287,000,000	344,000,000
Oats	712,000,000	940,000,000	1,081,000,000
Corn	44,000,000	31,000,000	26,000,000

In 1907 the wheat crop was 510,000,000 bushels.

The consumption of wheat per capita is very small in Russia, due to the fact that 70 per cent. of the population and their dependents are employed in agriculture: and the peasant class cannot afford to eat white bread.

It is estimated that the average annual consumption of wheat per capita is but 2.76 bushels. But the consumption of rye is correspondingly large, and averages 5.77 bushels.

The population of the empire is estimated at 130,000,000. Assuming that the estimated per capita consumption of wheat is correct, the annual domestic requirements are approximately 360,000,000 bushels. But to this must be added the seed requirements. Taking the last acreage figures available, and allowing the average amount of seed used in our Northwestern states, Russia annually uses almost 90,000,000 bushels for seed.

Thus it is found that the annual requirements for bread and seed are 450,000,000 bushels. Practically all over this amount that may be raised is available for export. This amount is probably under the annual requirements, but there is nothing on which to base a larger estimate, without knowing more accurately the average amount of seed per acre or the consumption per capita. In 1905 and 1906 a large amount of wheat, in the aggregate, was neither eaten nor exported. Owing to the inability of the railroads to haul it, it spoiled. No allowance can be made for the amount of old wheat carried from one crop to the next, but under normal conditions of crop and price, it will be the same year after year. It is only a guess, in any event.

When Russia gets back to normal crop conditions, the empire should raise 650,000,000 to 700,000,000 bushels and furnishing the importing countries 200,000,000 to 250,000,000 annually. There are now many factors that make it seem doubtful that the United States will ever again export to exceed 150,000,000 bushels, while 100,000,000 is likely to cover the annual exports of wheat and

flour for any one year. An exceptional harvest like that of 1906 would, of course, upset all calculations.

THE BLACK SOIL BELT.

The great wheat-producing area of Russia in Europe is almost entirely confined to the "Black Soil" belt of the southern one-third of the country. A line running from the southwest, just east of Poland, northeasterly to the Siberian line at a point where the Trans-Siberian railroad crosses the boundary, roughly marks the northern line of the Black Soil belt. The nearest approach of the black soil to Moscow is about 100 miles, to the southeast of the city. All the great wheat-producing governments of European Russia are within the Black Soil belt, with the exception of Perm, in the northeast, and Poland, in the southwest. Poland, as a matter of convenience, will be mentioned in this work as a government.

The Black Soil belt is approximately 1,500 miles in extent from the southwest to the northeast, and 800 miles north and south at its greatest width, which is at the eastern end of the Black Sea. It is estimated that the Black Soil region extends over an area of 260,000,000 acres.

The black soil is said to be a very uniform and definite stratum, varying in depth from a few inches to three to four feet. It contains a high percentage of organic substances, which is the cause of the dark color. This soil, scientists say, was formed upon rocky strata, impervious to moisture, that enable the soil to conserve the moisture.

In a general way the grain country of southern Russia resembles central and western Minnesota, eastern North Dakota, Manitoba and eastern Saskatchewan. The

soil is very similar in general appearance, and so is the topography. In fact, one might also say that it is like eastern Nebraska and Kansas, and southern Indiana and central Ohio.

Bessarabia, in the southwest, is a beautiful rolling country; not gently, but immensely rolling; and the hills are partly timbered. Kherson is gently rolling to level, and it is as beautiful a country when the crops are green as one will see anywhere in the world. From Kherson east the country is one vast prairie, and in the Don Cossacks one is reminded of western central Kansas or central Saskatchewan more than of anything else in North America. In the Don Cossacks one gets into the semi-arid region. Northern Caucasia changes to a territory of greater rainfall in the west, and the soil is blacker and heavier. It looks like that of the Red River Valley, in North Dakota.

To the northeast, in the Don and the Volga River region, is the great spring wheat territory, a country of light average rainfall, and also of light average yield per acre.

The greatest winter wheat acreage is in the southwest, the extreme south and in Northern Caucasia, which is in the southeastern part of European Russia.

The spring wheat acreage is also throughout the southwest, south, southeast and east and extends north of the Trans-Siberian railroad.

From the fact that the great wheat country is well within the confines of the Black Soil belt, the impression might easily obtain that wheat cannot so successfully be grown elsewhere in European Russia. This is not true, however, for it is grown to some extent throughout central and western Russia. Some of the largest yields per

acre are recorded in the western governments. But it is not within the scope of this work to discuss the reason why the wheat acreage is mainly confined to the Black Soil country.

Russia is divided into "regions" or groups of governments, designated as follows: Northern region, Lake, Baltic, Moscow Industrial, White Russia, Lithuania, Poland, Central Agricultural, Little Russia, Southwestern, New Russia, Ural, Middle Volga, Lower Volga region, and Northern Caucasia. These make up European Russia.

The important wheat regions or groups of governments are:

Poland, in the extreme west.

Southwestern region, made up of the governments of Podolia, Kiev and Volhynia.

Central Agricultural group, just south of the Moscow group, composed of Riazan, Tula, Tambov, Kursk, Orel and Voronezh.

Little Russia, between the Central Agricultural and the Southwestern groups, is made up of Kharkov, Poltavia and Tchernigoff or Chernigov.

New Russia lies south of Little Russia and bounds the Black Sea on the north. This is the most important agricultural group in the empire. It consists of Kherson, in which is Odessa; Bessarabia, Taurida (the Crimea is in Taurida) Ekaterinoslav and Don Cossacks. New Russia raises nearly one-half of the wheat grown in European Russia.

Middle Volga region is east of the Central Agricultural group, and is made up of Simbirsk, Saratov, Penza, Nizhninovgorod and Kazan.

Ural is to the northeast of Middle Volga, and the

three governments, Viatka, Perm and Oufa, cover an immense territory, extending to Siberia.

Lower Volga is also a great territory, and it includes Samara, Orenburg and Astrakhan.

Northern Caucasia or Caucasus lies northeast of the Black Sea and extends from the Sea of Azof to the Caspian Sea. This is an important wheat growing region, and has over 5,000,000 acres in winter wheat and 2,500,000 in spring wheat. It includes the governments of Kuban, Stavropol and Terek. The Caucasus Mountains on the south separate Northern Caucasia from Trans-Caucasia, in Asia.

The following table gives the acreage, both spring and winter wheat, of the principal regions, the total wheat acreage of European Russia and of the entire empire:

	Spring Acres.	Winter Acres.
*Poland	16,000	1,276,000
*S. W. Governments	302,000	2,866,000
Little Russia	3,180,000	504,000
New Russia	16,550,000	4,300,000
Central Agri. Region	1,355,000	632,000
Central Volga Region	2,970,000	35,000
Lower Volga Region	9,625,000	17,000
*Ural Region	2,230,000	3,000
No. Caucasia	2,550,000	5,100,000
*"Others"	363,000	476,000
Total European Russia	39,141,000	15,209,000
West Siberia	3,350,000	
Steppes or Central Asia	1,500,000	
Total spring wheat acreage		43,991,000
Total wheat acreage harvested in the Russian Empire in 1904		59,200,000

* Poland, and Volhynia of the Southwestern group of governments, are west of the Black Soil belt. Ural Region—Viatka, an unimportant wheat government, and Perm, an important spring wheat producer, are north of the Black Soil belt. "Others"—Unimportant wheat governments north and west of the Black Soil belt, and constituting probably two-thirds of Russia in Europe.

Governments having 1,000,000 acres or more in wheat are: Podolia, Kiev, Kharkov, Poltava, Bessarabia, Kherson, Taurida, Ekaterinoslav, Don Cossacks, Vorenzh, Saratov, Perm, Samara, Orenburg, Kubam, Stavropol and Poland.

As these are the great wheat producing governments the list serves as a guide in measuring the importance of crop damage. Even serious damage or protracted rains or drouth in other governments should not cause apprehension in the markets of Europe and America. For if half the wheat crop should be destroyed in all the rest of European Russia, while it would be serious locally, it would not necessarily have any appreciable effect on the amount of wheat for export.

The increase in wheat growing has, since 1898, been mainly in New Russia and the Lower Volga governments. From 1892 to 1896 it was in Caucasia, Siberia and Middle Asia. Perhaps the increase was not so rapid in the latter regions as the statistics made it appear. For it is probable that a considerable area in wheat was "discovered", of which there had been no previous record.

It is a matter of considerable importance to the importing countries of Europe that the wheat acreage of Russia is more than holding its own against rye. There has been but 1,000,000 acres increase in rye since 1899.

The average yield per acre of wheat in Russia is the lowest of all the wheat-growing countries. There has of late years been an improvement, however, or earlier statistics were inaccurate, so that the figures did not represent the actual yields.

As nothing is attained by quoting the early estimates, and as this work is not intended merely to record what is past, no mention will be made of estimates of yield that

cannot now be regarded as "live matter." Furthermore, it is the opinion of the writer that an average yield per acre for the entire empire is without any value whatsoever. It has no more meaning than the average yield of Europe would have. To put together the harvest results of Russia, Siberia and Middle Asia and strike an average is as sensible as to attempt to add an apple, an orange and a peach, divide the product by three and declare what fruit the result would be.

The only interest or value the yield per acre of a country can have is that it supplies something on which to base estimates of growing crops.

Fortunately, estimates are obtainable giving the average yields in the various divisions of the empire for both spring and winter wheat. They are shown in the following table for two five-year periods and for the year 1904:

Average yield of wheat per acre in Russia for the years given, in bushels:

	1894 to 1898.		1899 to 1903.		——1904.——	
	Winter.	Spring.	Winter.	Spring.	Winter.	Spring.
European Russia...	11.0	8.1	14.0	7.8	14.8	10.6
Poland	15.5	...	14.7	...	16.4	...
Caucasia	9.4	8.7	10.4	10.0	11.4	9.5
Siberia	...	13.5	...	9.9	...	9.4
Middle Asia.....	...	10.4	...	10.1	...	8.7

The year 1904 was the season of the immense harvest of 663,000,000 bushels for the empire. The average yields for that year are therefore of particular interest. It will be noticed that not only did the winter wheat average high as compared with the United States, but the spring wheat in European Russia yielded 10.6 bushels per acre. This is not far below the average of Minnesota and the Dakotas. For three years following 1904, however, weather conditions were unfavorable and the crops fell off badly.

CHAPTER IV.

RUSSIA (Continued).

System of Serfdom—Poverty of the Peasants—Emancipation of the Land Allotments—Holdings Very Small—Communal Holdings — Area Held by Peasants — State Lands and Crown Lands — Land Hunger — Cultivation of Peasant Lands—Diminutive Fields of the Peasants—Modern Implements—Systems of Cultivation—Spirit of Progress Working.

As PEASANT agriculture in Russia today is the result of the labors of those who, less than fifty years ago, were serfs, present conditions can be better understood after a glance backward. "Russian serfdom," writes I. M. Rubinow, economic expert, division of foreign markets, of the United States Department of Agriculture, "has frequently been compared with American slavery; yet the economic essence of serfdom differed from that of slavery as much as the historical mode of its origin. It arose, not by importation of chattel slaves from the outside and a direct utilization of their labor on land previously or independently acquired, but by a gradual extension of the powers of feudal landowners over their tenants. Through several centuries the process of limiting the tenants' freedom of movement gained headway, until about the end of the sixteenth century it was prohibited altogether. But while the peasant became the personal property of the nobleman, the land came to be considered the property of the peasant. In the vast majority of cases it was the peasant (the serf) who not only tilled but also gathered the fruit of the land. With the ex-

ception of the personal servants of the nobility who lived on the masters' estates and were directly supported by them, and whose conditions approached slavery, the Russian serfs were thrown upon their own resources."

The system of serfdom was abolished on February 19th, 1861, and the peasants, while receiving their freedom, were compelled to pay for the land that had been their own to use. Not only were they compelled to purchase it, but to pay, in many governments, more than its value. On this point Mr. Rubinow says:

"For the vast majority of the freed peasants who were living from the products of their own agricultural labor, an independent redemption of the land or even their own homes was out of the question. The Government was forced to come to their assistance with advances of money, which the peasants were required to repay with interest in 49 annual installments of 6 per cent each. According to the calculations of a Russian economist (Prof. L. O. Khodski) the redemption price was higher than the actual value of the land in 24 of the provinces, and the excess varied between 20 per cent and 80 per cent. An extensive statistical investigation by Professor Janson in 1881 has shown that the money payments exceeded the economic rent of the peasant's lot sometimes as much as 200, 300 and even 600 per cent."

So excessive became the weight of these redemption payments that, in 1881, a ukase was issued reducing them in most governments. The law went into force on January 1, 1885. Simultaneously redemption was made obligatory for all those peasants who had not accepted the plan up to that time. These constituted about 20 per cent. of the total number of the ex-serfs.

The repayments of redemption loans were then to have been completed in 1910 to 1932.

Notwithstanding this reduction, however, arrears were common and growing, though old arrears frequently had to be canceled by special manifestoes. Such cancellation by the manifesto of 1904, amounted to nearly 120,000,000 rubles. By a second manifesto November 16, 1905, the total abolition of these payments was promised beginning with 1907.

There were Crown peasants, State peasants and private serfs. The Crown peasants, those who were the property of the members of the imperial family, were allotted all the land in their possession at the times of the emancipation act, except in cases where it exceeded the maximum area allowed for the peasants in their locality. Their average holdings were larger than those of the ex-private serfs.

The State peasants were more numerous than those of the Crown. The land that they had cultivated before the emancipation act was the property of the state. The peasants paid a rental. Redemption of the land was made possible by the law of November 24, 1866, and became obligatory in 1886.

The average allotment of land has a very important bearing on agriculture in Russia today. Many of the shortcomings of agriculture as compared with the results in other countries are due to this allotment.

The average area of land allotted to the serfs, except in the old regions, was 9 acres for each male; to the Crown peasants, 13 acres; and to the State peasants, 16 acres. The holding of each household amounted to 24, 34 and 41 acres, respectively.

In the Central Agricultural governments, the Middle

Volga group, Little Russia and the Southwest, the average allotment to the serfs was but 6 to 8 acres to each male, and 10 to 12 to each State peasant. Almost 11 per cent. of all the peasant households held less than 5.4 acres per male person, or about 11 acres to each household. Ten per cent. of the households had allotments of 21.6 acres or more to each male person, and these held 23 per cent. of all the peasant lands. The holdings of a household reached 60, 80 and even 150 acres. The greater part of the peasantry between these two limits—79 per cent. of the families—had lots varying in size from 20 to 50 acres to each family.

But there is another and important division of the agricultural lands. That is, the commune, or common or community ownership. This is mentioned by one writer as a "specifically Russian institution."

There is, in European Russia, over 6,000,000 acres of land held in commune or common ownership. This system of ownership is most general in the Central Agricultural, the Moscow and the Middle Volga regions. It also obtains in the Ural, but only to a small extent elsewhere. In New Russia, for instance, only 200,000 acres is held in communal ownership.

Before emancipation many peasant villagers held the land in common and it was divided, to be worked by the different families. The custom was retained after the emancipation, yet the actual working methods of the Russian villages are far from uniform.

One of the weak features of the communal ownership is the redistribution of the land, in some villages every three years. The result is poor cultivation and resultings small yields. The effect is the same as in the renting of farm lands in the United States. Such farms

are almost always poorly cultivated, while the crops are noticeably lighter than those on the surrounding farms cultivated by the owners.

In 1903 it was estimated that the peasants owned 206,900,000 acres of arable land in European Russia. Practically all was under cultivation; the exact esitmate is 203,266,000 acres. Nearly all the land allotted to the peasants at the emancipation was arable, and as it is now under cultivation, there is no room for expansion except as they can acquire additional lands from the Crown or from estates.

We now come to private land ownership, or land owned by others than Crown or State peasants, which means, mainly, the estates.

At the time of the emancipation the land that was not allotted to the peasants was the property either of the State or of the noblemen. The lands of the State amounted to more than 400,000,000 acres, consisting mainly of forests in the north. The holdings of the nobility equaled that of the peasants. In 1858 the nobility equaled 1.5 per cent. of the population of European Russia and the peasants 82.5 per cent. By the act of emancipation the 22,500,000 private serfs of the nobility received 91,000,000 acres, or a little more than one-fourth of the land of the noblemen; and 247,000,000 acres became the private property of the 880,000 members of the nobility.

In 1877 a complete land census was taken. By that time the noblemen had lost a considerable part of their holdings and there had been some reparceling of the larger estates.

The census showed the 247,300,000 acres of private lands to be divided as follows: Owned, by noblemen,

197,520,000 acres,—average size of estates, 1,722 acres; merchants, 26,400,000 acres,—average, 2,093 acres; burghers, 5,155,000 acres,—average 89 acres; peasants, 13,514,000 acres,—average 49 acres,—and others, 4,677,000,—average 204 acres.

In 1877, therefore, there was 220,000,000 acres in estates of the nobility and merchants. Many of the estates were of great size, for the census showed that less than 1,000 proprietors owned 73,500,000 acres.

Since that time there has been a gradual but sure decrease in the holdings of the nobility. In 1900 they owned but 145,800,000 acres, as compared with their original 247,000,000 acres, and with 197,520,000 in 1877.

LAND HUNGER OF THE PEASANTS.

The peasants were meanwhile increasing their holdings of private land. From 13,500,000 acres in 1877 their land had increased to 53,700,000 in 1900. These lands should not be confused with the original allotment of land to the peasants.

The Russian peasant seems to hunger for land with an eager, natural craving, perhaps inborn and lying dormant through many generations of serfdom. Or, perhaps, his desire for land is but a demonstration of the law of self-preservation that governs us all—a sort of feeble reaching out for the means to sustain life or to prevent slow starvation. This innocent child of Nature, the Russian peasant, knows nothing but land, and can understand nothing but land. Land to him means life, and enough of it means—wonderful vision—assurance of something like comfort and contentment. The only hope that he has, the only light that he can see, the only thing that he can understand, is land.

Therefore the State lands and the Crown lands and those of the big estates haunt the peasant. He wants them with an innocent kind of want, much as cattle hunger for the choicest grass and will get it, too, unless the fence proves too strong.

Russia has a great problem to solve in this land hunger of the peasants, and at times it is feared that they will spread out over the neighboring estates and other lands and claim them by right of number. In 1906, when the writer was in Russia, this was feared and even expected. Should it ever come about, how can the peasants be removed? The problem is one that the Russian Government has reason to hope it may never be called upon to answer.

The difference between the farming methods and the implements of the peasants and those of the estate-owners is fully as great as might be expected. The average yield from the fields, those of the estates and those of the peasants, is also greatly in favor of the intelligent and favored farmer. As one travels through the grain fields of southern Russia he is more strongly impressed with what the small peasant-holdings mean than he could be by reading volumes about them. From the car window he sees miles and miles, yes, hundreds of miles of little plots of grain, usually long, narrow strips, each representing the holding of one man or one family, while the whole forms one great field, broken in regularity but not interrupted by fences or other artificial divisions. As one sees these thousands of little plots of grain and then considers that each represents the crop of some peasant upon which he must live or attempt to live until he can grow another, then it is that the traveler realizes the

condition of these people and something of their hunger for land.

Individually, these small holders of land cannot, of course, ever hope to own modern farm machinery. Collectively they may, but until it becomes general, a large part of the crops of the peasants must necessarily be sown and reaped by hand.

Yet modern farm machinery is gradually coming into the possession of the peasants, mainly through the efforts of the "Zemstvos", the local representative bodies that exist in most governments, and in each subdivision as well. The Zemstovs have established stores, the combined capital of which in 1903 was $3,400,000. The trade in farm implements has become an important part of these stores, but it is as yet an insignificant feature of peasant agriculture.

Odessa is now headquarters for many farm implement houses, among which America is well represented. The manager for one of the large American houses told me that within three years his importations of harvesters had increased wonderfully and that he was doing a very large business. Yet all the increase was new business—with people who had never before used modern machinery. While the crop failure of 1907 was a severe blow to agricultural Russia, it can, of course, only check and not stop the gradual development of progressive methods, although they will be slow at best.

One investigator says that in Kuban, a southeastern government, there are 3,500 threshing-machines, 5,000 grain-drills, 37,000 harvesters, 50,000 harrows, 70,000 grain-cleaners, and 65,000 cultivators. This is a region where, one generation ago, were only the wooden plow, the sickle, and the flail.

There is this writer says, "still a dense mass of Russians whose yearly habit is to wait until their wheat is dead ripe, then in a few days of frantic labor to cut down half of it with sickles, leaving the rest to rot in the fields. And in one Caucasian province, richer in its soil than Iowa, it is the custom of the wandering natives to move every three years to a new tract of land, in order to avoid the trouble of fertilizing the soil."

The proprietors of the estates may cultivate their land themselves, hiring peasants to do the work, or rent the land to peasants. Many of the estates are thoroughly equipped with modern machinery and implements, and the land is cultivated on a business-like basis, with the result that high average yields of wheat and other grains are realized.

It is estimated that, throughout the empire, the average yield of spring wheat on the estates is one bushel per acre higher than on the peasant lands, and the winter wheat three bushels greater. The great differences in winter wheat yield is attributed to the use of manure on the estate lands, while the peasants seldom use any fertilizer.

In European Russia the difference in spring wheat is greater. It is estimated at 1.6 bushels.

While the average yield of winter wheat has steadily increased during the last twenty years, the gain has been a little greater on the estates than on peasant lands.

Russia still adheres to the three-field system of agriculture in the center of the wheat belt, although it has generally been abandoned elsewhere throughout Europe. The practice under the three-field system is to sow a field to a winter crop one year, to a spring crop the next and to permit it to lie fallow the third. Of course, one-third

of the land is idle all the time. This rotation, of course, cannot be followed in the dry parts of the east or north of where winter crops thrive.

In considering the agriculture of Russia one should not become imbued with the idea that it can continue as it is. The spirit of progress is working uneasily in the mass, and there is so much to work on that there will be violent upheavels and set-backs, but development is sure. It is an encouraging sign that the average yield of wheat has increased steadily; and there is room for so much improvement in this direction that peasants may be brought to see that greater yields can be raised on their present holdings, which would be better than having a little more land to half cultivate.

As gradual improvement in agricultural methods comes, the crop failures will be correspondingly less severe. It is probable that as a direct result of more intelligent methods famine will gradually become a thing of the past in every agricultural government.

CHAPTER V.

RUSSIA (Concluded).

Moving the Crop—Speculators Buy From the Peasants—Wheat Headed Toward Odessa—In Odessa—No Price Basis—Grain Storage—Strikes of Laborers in the Harbor—Traffic Tied Up—Methods of Grain Exportation—Odessa Grain Exchange—Other Ports of Southern Russia—Elevators at Novorossisk—Exports From Siberia and Eastern Russia—Season of Navigation.

Moving the wheat crop in Russia is altogether a different matter from what it is in the United States or Canada, where the great line elevator companies and other buyers have elevators at every railroad station, with ample facilities for receiving all the grain brought to them. Moreover, in America and Canada buyers pay the farmer the ruling prices at the market centers less freight and other charges and about one per cent. margin of profit. Or, if the farmer prefers he may ship his grain to the nearest market, to some member of a grain exchange, where he will get the same price that any big elevator company would. Furthermore, he will be advised of the hour of the day his grain was sold, and to whom. His interests are safe-guarded in every way possible by the grain exchanges.

In Russia, even near the great exporting city of Odessa, the method of buying and handling grain is of the crudest and most primitive kind. The grain is sold by the peasants to speculators or to merchants—country storekeepers, they would be called in America. And as the buyers are in the business for the profit they can

make on the grain, it requires no great perception to see that they buy as cheaply as possible. In America the price makes no difference to the elevator company, for it "hedges" its grain immediately by selling it for future delivery in the pit.

To digress for a moment, the matter of speculation in wheat seems apropos at this point. While this is being written there is a bill in the House of Representatives and another in the Senate at Washington to prohibit future trading in grain. It is hoped by those who are interested in the measure to thus stop speculation in wheat. This is mentioned merely to contrast the American system of grain traffic with the lack of system where there are no great central markets; where the traffic is in the hands of individuals unrestrained by associations or organizations, and with no price basis to work on. That is what America has grown out of; and while to abolish future trading would not reduce the grain business to the level of Russia, it would place the farmer at the mercy of the buyer. For, in the absence of future markets, where the elevator company can immediately sell for future delivery the grain bought in the country, it would not be safe to buy great quantities and carry it until there is a milling or an export demand. Either the farmer would himself hold it until the actual consumptive demand brought him a good price, or he would be compelled to sell to some one willing to do so. And, of course, no one will buy wheat that he cannot promptly sell, unless he gets it very cheap.

Now this is the situation of the Russian peasant. He must sell his wheat to speculators, the amount they can take depending upon their means; or to merchants, who, of course, buy on the same basis. Then the agents

of exporting houses or jobbers at Odessa buy the wheat from the first buyers.

Yet wheat is hauled long distances in carts to the cities. During the fall, when the roads are good, hundreds of carts loaded with grain are driven to Odessa by peasants from distances of many miles. The greater part of the wheat comes to that market by rail and in barges down the Dnieper river. During the heavy movement of a good crop, no attention is paid to the world's wheat markets. The wheat is forced for sale, and the exporters take advantage of the opportunity to buy the wheat as cheap as possible. At other times, New York, Chicago, London and Liverpool prices have an influence on the price paid at Odessa.

There are speculators in Odessa, also, and as there are many warehouses just outside the city, where the grain can be stored, the peasants with their cartloads of wheat fall a prey to them even there.

Wheat that comes into Odessa by train may be unloaded at the warehouses and stored for months, if the owner desires. Grain in Russia is handled and transported in sacks and not in bulk as it is in America east of the Rocky Mountains.

Grain that comes down the river in barges cannot be stored, for the very good reason that there are no elevators in which to store it. It must be transferred, within eight to ten days, to steamers. Here it comes in contact with the labor question. Every market in Europe and America occasionally hears of strikes of laborers in the Odessa harbor.

The harbor traffic is at the mercy of the laborers who load and unload the vessels. They strike on the

slightest provocation or what seems to them a provocation.

Owing to the power of the laborers very little progress has been made at Odessa in introducing modern methods of handling grain. There are no great elevators, as there should be, from which grain can be spouted into the holds of vessels. Nor is it likely there ever will be. Exporters say that it is possible to introduce modern methods at the newer ports, but that prejudice makes it impossible at Odessa.

There are, however, a few "floating elevators" in the harbor, similar to those used on the North river, New York, for loading grain to steamers from lighters. Yet the laborers decree that these shall be used only when all the men are employed also. There have been many strikes on the harbor due to these floating elevators. Just as soon as there are not enough barges to be unloaded to keep all the laborers and the elevators employed, the men demand that the labor-saving machines cease work. Either the machines stop or there is a strike.

How effective in tying up traffic a strike of the Odessa dock and harbor laborers can be, the writer was privileged to see. Leaving Odessa by train for the east, I expected to return on the Black Sea by steamer. There is a regular line of passenger boats to and from the eastern end of the sea. There was some talk in Odessa of a strike on the harbor, but I thought nothing of it. But at Novorossisk, in Caucasia, I was told that no steamers were sailing for Odessa, as every vessel that had gone there was still in the harbor, tied up by the strike. After several days, however, I was enabled to take passage on an English tramp steamer, after getting permission from the chief of police at Novorossisk. We reached Odessa early in the morn-

ing, and the harbor afforded the most picturesque marine view that I have ever seen.

The harbor is not a large one, and yet there were vessels enough in it to comfortably fill one of the greatest of ports, or it appeared so. Practically all the vessels of the Black Sea were here, and they were crowded as closely as Dutch fishing boats in port. There were little steamers and big ones, and sailing craft from great schooners down to small semi-Turkish appearing boats that had seen service since the Crimean war. There were barges from many miles inland that had come down the rivers, and there were foreign vessels from all over the world. They were all awaiting the settlement of the little labor difficulty, so that they could load or unload.

There is no other port in the world from which grain is shipped, except in Argentina, where traffic is interrupted by strikes as it is at Odessa.

There are delays at Odessa besides those caused by labor troubles; for there is room for only fourteen grain steamers to load at once, so that sometimes boats are compelled to wait three weeks for their turn.

Wheat is shipped from Odessa to London, Hull, Liverpool, Rotterdam, Antwerp, Marseilles and Genoa.

There are regular lines of steamers between Odessa and the principal European ports, so that "parcels" of grain may be shipped. There are not many exporters at Odessa big enough to buy a full cargo of grain. Parcels of a few thousand bushels are separated from one another in the hold of the vessel by mats or canvas. There is a charge for this "separation," as it is called, and the charge is called "mat money". Several parcels of wheat for different importers, and parcels of barley, oats, rye and flaxseed may, by the use of mats, be shipped

in the same steamer. And, by the way, speculators in Odessa buy grain in small lots, make up parcels and sell to shippers. The speculators may hold their parcels in warehouses for months, until they either get their price or finally sell because they cannot get it.

There is a grain exchange at Odessa of considerable local importance. This is headquarters for the principal shippers or exporters; and here I met a fine old Russian, now semi-retired, but at one time one of the biggest exporters in Russia. He invited me to take luncheon with him, and over his glass of vodka-and-water and a cigarette, he told many interesting things regarding the grain trade. His partner, who accompanied us, of a Hebrew type though he may not have been a Jew, impressed me as being one of the keenest, brightest men that I have ever met. Both partners spoke English, and the Russian spoke and wrote French, German and Italian as well. I have since had a letter from him, written in excellent English, very dignified and correct.

There are many Jews connected with the grain trade in Russia; so many, in fact, that the grain exchange at Odessa limits the number that may belong to the exchange to 25 per cent. of the total membership.

What is true of Odessa as regards the conditions that surround the grain trade is true of the other Black Sea ports in a general way, except that the others are smaller and are not so subject to labor rule. The population of Odessa is 450,000.

The next export port in importance is Nikolaiev, at the mouth of the Bug river, on a large land-locked harbor, 100 miles from Odessa. It is almost as great an exporter as Odessa. The population of Nikolaiev is 92,000.

Berdiansk, on the Sea of Azof, is the fourth export port in importance.

Taganrog and Rostov-on-Don are important export ports for eastern Russia and western Siberia. They are 200 miles north of the Black Sea. Taganrog is on the Gulf of Taganrog, an offshoot of the Sea of Azof. Rostov, the third in volume of exports, is on the Don river fifty miles away. The population of these places is 52,000 and 120,000, respectively. They are summer ports. The Gulf of Taganrog freezes early.

The winter port of this eastern country is Novorossisk, on the Black Sea just south of the Caucasus Mountains. It is in Trans-Caucasia, Asia. This port is 370 miles southeast of Odessa and 200 miles directly south of Rostov. The harbor is almost never closed by ice.

Novorossisk is a small place and of no importance except for its grain interests. The railroad to the town, from the north—and an excellent road it is—I was told was built by the same capitalists who control the grain trade in the town. The railroads of the country are generally owned by the government.

Novorossisk has a large, modern elevator and three very large one-story warehouses. These are all owned by a private company. The elevator is of cement construction and is absolutely fireproof. The only wood about it is in the grain cleaning machines and the window-casings. Some of the machinery was made in America.

The storage capacity of the elevator is 3,000,000 poods or 1,800,000 bushels, while the three warehouses have a combined capacity of 4,200,000 bushels. The total storage capacity at this little town is one-sixth as great as the elevator capacity of Minneapolis.

With the usual lack of business foresight, for which the Russians are noted, the impractical men at the head of the enterprise built the elevator back from the water-front fully a quarter of a mile. The site was probably chosen because of its commanding position; the view of the harbor is excellent. But when it was built the grain in its bins was still a quarter of a mile or more from the steamers, and to reach them it was necessary to erect what is probably one of the longest belt-conveyor galleries in the world.

Now, instead of spouting the grain directly from the bins into the hold of steamers, it is carried this great distance, at a considerable cost, of course, over the conveyor-belts to the docks. Sometimes grain is also loaded into cars to be taken down to the vessels in this manner. From the cars the sacks of grain are carried on men's backs up to the deck of the steamers, and the grain dumped into the hold.

Wheat comes long distances and by devious ways to find storage at Novorossisk until called for by the importing countries of Europe.

From western Siberia it comes to the Volga river and there joins the great stream of wheat from the Volga valley. The grain comes down the river in barges to Krutaia (in winter or during a heavy movement it comes all rail), where it is transferred to cars. From here it goes by rail to the Don river and is transferred to lighters or barges and floated down to the Gulf of Taganrog, from whence it is brought through the Sea of Azof into the Black Sea to Novorossisk for storage or for immediate export. When the ports of Taganrog and Rostov are closed for the winter, the grain that would otherwise

be shipped from those ports is brought on by rail to the winter port.

The cars in eastern Russia carry a load of the same size as the cars in our Western states did twenty years ago. That is, 450 bushels. I was told that the barges on the Volga carry 3,000 tons or 110,000 bushels of wheat. This is equal to a small steamboat load out of Duluth, or a small cargo on the Atlantic steamers. I cannot vouch for the accuracy of the statement. The barges or lighters used for canal and river transportation in Germany and the Netherlands carry from 320 to 650 tons of wheat, or from 10,000 to 22,000 bushels. The steamers in the grain trade between Duluth and Buffalo carry from 100,000 to 400,000 bushels. The average is approximately 250,000 bushels.

Navigation usually closes at the Russian ports on the following dates:

On the Sea of Azof, November 20th.

Odessa, occasionally in mid-winter.

Noverossisk, rarely.

Crimean ports, rarely.

Nikolaiev, December 15th, unless kept upon by ice-breakers.

Baltic ports frequently close about Christmas. Libau seldom closes.

Nikolaiev reopens about March 25th; the Sea of Azof, March 30th, and the Baltic ports, April 6th.

CHAPTER VI.

HUNGARY.

Unusual Featues of Interest—An Agricultural Country First—Unfortunate in Climate—Yield of Wheat—Size of Crop—An Exporter—Budapest a Milling Center—Agriculture—Farms and Large Estates—Development of the Peasant-Farmer—His Troubles With the Money-Lender—Co-Operative Credit Banks—Advancement of Agriculture.

HUNGARY is a country containing unusual features of interest in relation to wheat. It has a great milling center at Budapest, a city of over 700,000, and at one time the "Hungarian process" of milling made the city celebrated the world over. Budapest also has a large and important wheat market, resembling American grain exchanges more than any other European market does. Hungary is an important wheat-growing country, but now only a small or moderate exporter, excepting to Austria; and the exports go out as flour. Furthermore, the country is of particular interest agriculturally, not only because of the high state of development in its great central plains district, but by reason of the organization of agriculture. The farming classes and their sympathizers,—the agrarians they would be called in Germany,—have great influence in parliament and have had laws enacted that it was expected would be beneficial to agriculture. Hungary is an agricultural country first, with commerce and manufacturing a poor second.

The country is fifth in size of crop, being exceeded by only the United States, Russia, France and India. It will be considered independently of Austria in this chap-

ter. Hungary is unfortunate in its climate, at times having great extremes—heat, drouth or rains—that cause crop shortages.

The average yield of wheat per acre is high. In 1902, the latest estimate available, it was 20.4 bushels. From 1894 to 1901 the average was 17.1 bushels, although the short crop year of 1897 is included. The loss that year was over 40,000,000 bushels, due to rust. There was another heavy loss in 1904, though not so great. The biggest crop Hungary ever raised was in 1906, when the total yield, including the provinces of Crotia and Slavonia was 200,000,000. There was a very short crop again in 1907, due to an unfavorable winter followed by early extreme heat and drouth. Owing to the uncertainty of the climate there is less regularity in the average yield than in many other countries.

The wheat crops of Hungary, including Crotia and Slavonia, and of Austria, for the last six years were as follows, in bushels:

	Hungary.	Austria.
1907.....	124,000,000	52,000,000
1906.....	200,000,000	48,000,000
1905.....	170,000,000	54,000,000
1904.....	148,000,000	54,000,000
1903.....	166,000,000	47,000,000
1902.....	175,000,000	50,000,000

The crop is winter wheat, seeded in the autumn and harvested in July.

Austria-Hungary requires annually for consumption and seed, it is estimated, 185,000,000 bushels. When a full crop is raised, therefore, Hungary becomes an exporter; but the exports are mainly in the form of flour. The exports do not, however, correspond with the differ-

ence between the estimated requirements and the crop, so that it is probable the consumption has been underestimated.

As an exporter of flour the country has lost the importance it once had, when the second largest milling center in the world was built up at Budapest. The industry developed largely on the export trade in flour. Up to June, 1900, the mills were permitted to import wheat, grind it in bond, and export the flour. The mills of Budapest imported considerable quantities of the cheap lower grades of Servian and Roumanian wheat, mixed it with good native wheat and exported the product. The cheap mixture enabled them to do this profitably. The farmers raised the cry that Hungarian wheat was being neglected (North Dakota raised the same cry in 1908); that the price suffered and they had influence enough with the government to have the drawback privilege withdrawn. There is an import duty of 19.5 cents a bushel on wheat. Since that time, though not due entirely to that cause, there has been a steady decline of the milling industry of Budapest. Some of the milling companies have failed. One was absorbed by another, while the statements of others showed an unprofitable period. Only three of the large companies paid dividends in 1905.

The mills of Austria are now strong competitors of Budapest and are endeavoring, by arousing local and national prejudice, to exclude Hungarian flour. Austria is the principal market outside of Hungary for the mills of Budapest.

Hungary is a country of extremes. The great mills of Budapest are as perfect as any in the world. Yet there are hundreds of mills on the Danube so primitive

that even the grist mills of backwoods districts in America are modern by comparison. And so it is in everything. Seek any extreme in Hungary, and you will find it. There is a high development in art, in medicine, in electricity, in mechanics, architecture and in agriculture; development that on a small scale equals that of any other country. Yet there is always the other extreme. Hungary lacks a substantial middle class.

The parliament building at Budapest, said to be one of the most beautiful public buildings in the world, was built to represent, in its style of architecture, the origin of the Magyar, or Hungarian people. It combines the Gothic, the Roman, the Moorish and the Byzantine; and it is this combination, with a mingling of other people, that makes up Hungary.

The agricultural part of the country is the central, southern central and the valley of the Danube in the west. The country is almost surrounded by mountains and one-third of the entire area is covered with timber. The timber laws are rigid.

A peculiarity of Hungary is the average size of the farms which, roughly, is almost 250 acres. This is due to the many large estates, both private and State. The government has a large number of model farms throughout the country, ranging in size from 10,000 to 100,000 acres. The intention is to teach the surrounding farmers scientific farming by object lesson.

If the high average yield per acre of wheat is due to efforts of the agricultural department, then more has been accomplished in that direction in Hungary than in America.

There has been great improvement in the last decade in the position of the individual agriculturists in

Hungary. This is traced by those who have studied the matter to the organization of an effective system of agricultural credit. The large land owners first resorted to this, in the sixties, in an effort to prevent the breaking up of the great estates.

The peasant-farmer of Hungary is a development from what he was when the feudal system disappeared from the country. That was in 1848; so the great agricultural peasant class of today has developed in that comparatively short period. The position of the peasant, like that of the Russian serf, was hopeless until he could own land of his own. It was not until 1860, however, that a system of land registers was completed, showing the land that each peasant owned.

But when he found himself a man of independent substance, he also learned that there were fresh troubles in store for him. The money-lenders got after him. Writing of the organization of agriculture in Hungary, Edwin A. Pratt says of the money-lenders and their methods:

"They were mostly Jews from Galicia or Russia—men who neither by race or language had any affinity with their victims—and they so operated that many of the peasant farmers virtually became their slaves. There was a monotonous sameness about their methods of procedure. They would first start an inn, or, alternately, a store, and be especially friendly with any one of their customers who happened to have a fairly prosperous property. On the slightest suggestion they would offer to lend him money, and at first would press him to accept it—particularly on occasions when he might have taken more liquor than was good for him. In this way the peasant would accumulate a bigger and still bigger bur-

den of debt with the apparently easy-going innkeeper. Then, suddenly, at some moment when he knew the debtor could not possibly pay, the money-lender would demand payment in full, and take possession of his entire property. But the money-lender did not want to be a farmer himself, so he would let the peasant remain there, requiring him, however, to pay not only rent for house and land, but even for the hire of the oxen, hitherto his own, which he required for the plowing operations. In this way everything the peasant himself gained, save only a sum barely sufficient to keep himself and his family alive, went into the pocket of the money-lender."

And yet people wonder at the hatred of the Jews in southwestern Russia and the Balkan states, where similar practices have gone on since the Jew became a commercial man and the peasant a farmer. The Jews are in every part of southeastern Europe and they are the commercial and financial leaders. No out-of-the-way place is too remote for them, if there is anything to be bought or sold. Even down in the marsh-lands at the mouths of the Danube, in the fishing villages, a hundred miles away from a town of any size, and in the most unattractive place imaginable, Jews are there, the only purchasers of the fish.

Yet the Magyar peasants of the plains of central and southern Hungary, while less susceptible to the wiles of the money-lenders than the peasants of the north and east, were forced to pay 40 to 50 per cent. when they found it necessary to borrow money. The Magyar peasants are more intelligent than the Slavs and the Roumanians of the eastern part of the country.

Fortunately the peasants were not left to work out

their own salvation. Prominent Hungarians who were watching the development of their country saw the necessity of safeguarding the agricultural interests, and to do this the peasant-farmers must be given the advantage of an easy co-operative credit such as had been secured by the large land-owners. At a conference in Budapest in 1885 the matter was discussed, and it was resolved to take action.

The final result was the creation, in 1898, after many experiments, of a central co-operative credit bank, operative over the entire country. All the local existing co-operative credit banks might become affiliated by subscribing for shares; and various practical benefits, in addition to the facilities of obtaining advances, were offered to them as an inducement. The State or Government took shares to the amount of $200,000, and claimed the controlling voice in the management. It was the intention that only the State and the co-operative associations should be the ultimate shareholders.

By the end of 1903 there were some 2,000 local co-operative credit banks in Hungary.

These banks are in in the peasant villages throughout the country, and the benefit they have been and are, cannot be calculated. They not only freed the peasants from the grip of the money-lender, but they have been the means of encouraging the peasants to co-operate in other matters. There are now not only many county agricultural societies but a national league of agricultural societies. But co-operative credit is the backbone of the new agriculture that is now flourishing in Hungary.

CHAPTER VII.

BALKAN STATES.

A Group of Kingdoms and Principalities—A Great Battleground—Russia Takes Bessarabia—Crops and Climate—Exports—Roumania—Important Exporter—Elevators on the Danube—Agriculture—Bulgaria and Eastern Roumalia—Servia—Turkey in Europe—Importance of Balkan States in European Markets — The People — Roumania Home of the Gypsy.

EUROPE is, by both natural and agricultural conditions, divided into four sections, when one is considering wheat growing; though, of course, these divisions are somewhat arbitrary. Western and southwestern Europe form one of these arbitrary divisions. Russia, of course, stands by itself. The third division, based upon agricultural conditions and mountain ranges, may be made to include Austria-Hungary and provinces. This leaves for the fourth division the southeastern part of Europe, a wonderfully strange country, the Balkan peninsula.

The Balkan peninsula, lying between the Black and the Adriatic seas, as the term is understood, includes in addition to the kingdoms, provinces, principalities, etc., on this peninsula, Roumania, one of the Balkan states north of the peninsula.

Between 1354 and 1478 the Turks became masters of nearly the whole of the Balkan peninsula. It was fought over for hundreds of years, and almost every foot of it is a battleground. The disruption of the Turkish realm began in the early part of the 19th

century. One by one the little provinces broke away from Turkey and became independent while others were annexed to Austria or Hungary. The last division was after the Turko-Russian war, when Roumania became independent of Turkey but lost a large slice of rich agricultural land on the north—Bessarabia—through the greed of Russia.

To touch upon this transaction, a divergence from the subject for a moment may be permissible, for it shows one of Russia's most striking characteristics. In the war with Turkey, Roumania, a province of Turkey, fought with Russia and really won the decisive battle over the Turks. Russia was grateful, of course, but greedy. It wanted Bessarabia for two reasons. Its possession would give an outlet via the Danube, and, furthermore, Bessarabia is an exceedingly fertile country. Russia therefore absorbed Bessarabia, regardless of the violent protests of its ally, Roumania; but to seem fair, it gave Roumania the low and marshy principality (taken from the Turks) between the Danube and Bulgaria and the Black Sea, Dobrudscha. The latter is not worth a tenth part of Bessarabia, which is now one of Russia's most fertile governments. But that is Russia's way of dividing the spoils.

The Balkan states as generally understood are, Roumania, Bulgaria with Eastern Roumalia, Servia, Montenegro, Bosnia and Herzegnovina (part of Austria), Dalmatia (an Austrian crownland), Turkey-in-Europe (Turkey proper, Salonika, Monastir, Albania, etc.), and Greece. Crotia and Slavonia, provinces of Hungary, are not included in the group. In the grain trade Turkey and Greece are considered apart from the others.

The crops of the Balkan states undergo some violent

fluctuations, due, doubtless, to a combination of poor farming and extremes of climate.

A normal wheat crop for the Peninsula, including Turkey, is 150,000,000 to 175,000,000 bushels. In 1906 a record crop was raised, amounting to 200,000,000 bushels. Yet in poor years the total has fallen as low as 75,000,000. The largest crop ever raised previously to 1906, according to published figures, was in 1905, when the total was approximately 190,000,000 bus. While Roumania and Bulgaria had particularly good crops that year, the other countries did not have unusual yields.

This part of Europe is treated to great extremes in climate. There are some seasons of excessive rains, and again of drouths. The summers are exceedingly hot.

The annual exports of wheat from the Balkan states are important. They amount to 50,000,000 to 75,000,000 bushels; and the grain goes mainly to Belgium, Holland, Germany and Italy. Switzerland takes some of the best wheat from Roumania. Indian corn exports go to the United Kingdom. A short crop of wheat in the Balkan states means that some other country will be called upon by western European markets to supply the deficiency.

Roumania is the largest and most important of the Balkan states. It is a kingdom made up of the two old principalities of Moldavia and Wallachia, with the addition of Dobrudscha, formerly a part of Bulgaria.

ROUMANIA.

The principality of Roumania came into existence in 1859 to '61, through the union of the principalities of Moldavia and Wallachia. These made their appearance in history towards the close of the Middle Ages.

Then followed a long period of vassalage to the Ottoman sultans. Bassarabia was severed from Moldavia in 1812.

Roumania is not only an important wheat-growing country, but a large exporter through the ports, on the Danube, of Bralia and Galatz. Each port has a large, modern elevator with concrete bins or silos. They were built before fireproof elevators were generally used in the United States.

The wheat crop of Roumania ranges from 50,000,000 to 100,000,000 bushels, although in a very bad year the yield falls even lower than the smaller amount. The crop of 1906 was estimated at 108,000,000. Yet it is doubtful whether the figures for these countries are anything more than the result of guesses based on exports. The statistical departments of the governments are entirely inadequate; and, further, there is nothing but the exports as a basis for an estimate.

The peasants of Roumania are not good farmers, and, in fact, there is not much incentive for them to improve their methods. The peasants are, practically, slaves to the large estate-owners and the money-lenders. They are kept in debt from year to year, so that a bare living is all that they get from their own land or that which they work "on shares."

There are many large estates in this country, and this makes the position of the peasant hopeless. The land is, as a rule, rich and capable of producing large crops. The writer has seen Roumania pretty thoroughly from one end to the other; and, in appearance, it is one of the finest agricultural countries in Europe, and one of the most poorly cultivated. The central part is level —real prairie land.

BULGARIA.

Bulgaria, separated from Roumania on the south by the Danube, is a principality and pays tribute to Turkey. Eastern Roumalia is a division of Bulgaria. It was created out of Turkish property by the Congress of Berlin of 1878, and was made autonomous and placed under a Christian governor. A revolution occurred in 1885, and the province was proclaimed a part of Bulgaria.

Bulgaria is the second of the Balkan states in importance. The peasants, as a class, are more independent than those of Roumania. There are relatively fewer large estates and more individual farmers, and the soil is better cultivated.

In estimates of yield, Eastern Roumalia is included with Bulgaria. In 1906 the two countries raised 55,000,000 bushels of wheat, while in 1901 the total was but 30,000,000. About 45,000,000 is normal. The average yield per acre is estimated as 10.5 bushels for one year and 17.5 another year. Statistics are rather meager. Exports are by the way of the Danube and also by two Black Sea ports in Bulgaria. Some wheat also goes out through Turkish ports.

SERVIA.

Servia, a kingdom west of Bulgaria, is the domain of Peter, who was made both infamous and king at the same time, when his friends killed the reigning king and queen, one night.

Until three or four years ago the agricultural situation in Servia was as deplorable as its political position. About that time co-operation of certain financial inter-

ests began to get the peasants out of the clutches of the money-lenders, and agriculture has since been improving. This is not to say, however, that Servia is anywhere near a modern country agriculturally. In fact, Hungary is the only country east of Germany that is truly enlightened.

A good crop of wheat for Servia is 10,000,000 bushels, so that, alone, it is not an important factor. But this total may be doubled within a few years by intelligent methods. The climate of Servia is better than in the other countries mentioned.

TURKEY-IN-EUROPE.

Of Turkey-in-Europe, even those who have gone deepest into crop statistics say that little is known of its agricultural resources. Year after year the wheat crop is placed at 20,000,000 to 25,000,000 bushels, accordingly as the weather conditions have been favorable or unfavorable. Constantinople is a small importer of flour, while the country exports an unimportant amount of wheat.

In the markets of England and the western part of the continent, the crops of the Balkan states are of greater importance than their size might seem to indicate. This is because of the relatively large exports.

THE PEOPLE.

The peasants of Roumania live largely on Indian corn—maize. During a year of a poor corn crop, corn is imported into Roumania to feed the peasants and the poorer classes in the towns.

It is estimated that the average per capita consumption of corn in Roumania is 8.5 bushels, and of wheat,

5.4. The corn crop of the country ranges from 55,000,000 bushels to 100,000,000.

The estimated consumption in Bulgaria is 3.4 bushels of corn and 7.8 of wheat. In Servia, 9 bushels of corn and 3.3 of wheat.

The people of Roumania are chiefly Roumanians or Rumans, which is the same as Wallachians or Wallachs. There are also Bulgarians, Hungarians, Jews, Armenians and Greek. Persians and Turks are numerous in Galatz, Bralia and Bucharest. In Galatz it is said that thirty to forty different countries are represented, but that there are no Roumanians. Several languages are absolutely necessary in the banks and grain exporting offices. In the office of a grain exporter on whom I called, four languages were in daily use. These were Roumanian, French, German and Italian.

Roumania is the home of the Gypsy. There are 200,000 in the country, 20,000 in Bulgaria and 45,000 in Servia.

Bulgaria has for its population Bulgarians, Circassians, Roumanians, Jews, Armenians, Albanians and Gypsies.

CHAPTER VIII.

TRAVELING IN ROUMANIA.

A Night in a Crowded Compartment—Native Fellow-Passengers—The Comic Opera Man—Closed-Window Incident—A Glorious Morning Landscape—Peasants on the Way to the Fields—Cultivating Indian Corn—Bucharest, Braila and Galatz.

TRAVELING in southeastern Europe means the continual unfolding of surprises and features of unusual interest. Yet it is not a country for the holiday tourist, but for the seasoned and experienced traveler, the man who is willing to undergo inconveniences, that he may see strange peoples and their ways and learn things that are not taught in books.

One night that the writer spent in the crowded compartment of a car in Roumania will never be forgotten nor will it ever be repeated. And yet the experience, now that it is past, would not be blotted out even if that were possible.

The border-line of Roumania on the Hungarian side was reached late in the evening. Here passports were examined, and one poor fellow who had none was compelled to remain behind. It was necessary to change cars just across the line in Roumania, and at the station the passengers were registered according to the story their passports told; their baggage was examined and time was given them to get luncheon at the station diningroom. The lone American now felt that indeed he was in a strange land, for of course no one spoke English nor did any one understand the little German with

which he tried to explain the nature of his appetite. There was no lunch-counter here, enabling one to point to the things that looked good if he did not know their name. But something was finally obtained and in due time the train was made up. There was no sleeping car, but my compartment contained only one other passenger. It was different before morning. The night was as dark as a night could be, and it was impossible to tell whether we were in the mountains or on the plains. All that I knew or realized was that here was a lone atom from America, merely a speck of dust on the earth's surface, in a strange country, with no knowledge of the language nor of the people nor the customs. The night was dismal, and strange-looking people were beginning to fill up the compartment as the train stopped at the numerous stations.

In the cities of any European country the dress of the people varies little from the conventional. But it is different in the rural districts of these southeastern countries. Many of the costumes of both men and women are extremely picturesque. One man in particular who came into the compartment would have attracted favorable notice in a comic opera, by reason of his dress and his face and figure. He was a heavily-built man, his face was dark and he wore a fierce black mustache which seemed in keeping with his native costume. He wore a short jacket, artistically cut, of light-colored cloth, beautifully worked with black braid. His trousers were very tight-fitting, and a flowing sash encircled his waist. He was probably a large landowner; his appearance indicated prosperity. He was on his way to Bucharest, to attend the exposition that was about to open.

It is a peculiarity of eastern Europe that fresh air is not regarded as desirable in cars. The people are afraid of drafts, and even on a hot day the street cars are often tightly closed. Having observed this, I had selected the corner of the compartment (one, by the way, not thought desirable) by the window and facing the engine. It was not long after the compartment had filled up when the air-sensative Roumanians closed the windows, one of them discourteously closing mine without so much as the usual "pardon!" The lights were out and the compartment was now as dark as the night; and some seven "foreigners" and one American—an American is never a foreigner; he is like the Indian and the wigwam, the latter may be lost, but the Indian never —were stretched out in various attitudes of ungracefulness. The comic-opera man was as disreputable as the rest of us, but he seemed to feel it more; for occasionally he punctuated the night by going into the corridor to smoke cigarettes and to drink from a bottle.

But to return to the closed-window incident. The American, not liking the thought of suffocation, nor caring to antagonize his fellow passengers, surreptitiously opened the window a crack and laid his head to rest where the cool, fresh Roumanian night air blew cinders into his hair and dust into his countenance until the morning light began to show in the east.

And then what a glorious picture unfolded! We were on the plains of central Wallachia, and as the light strengthened I could see that we were in a well-cultivated agricultural country. The early morning mists were hanging over the land, giving an "atmosphere" that the man who rises late never sees. We passed a peasant village before it was yet light, and out of the mists and

disappearing darkness I could see a number of peasants on the road just leaving for the fields. Only a glimpse of them was had, but I could see men and women and children, all dressed in the white costumes peculiar to the peasant class of the country. It was like a picture flashed upon the screen of a country and people never seen before; and it told a story—the story of simple peasant life and a long day of toil in the fields. It told the story of a people who rise while it is yet dark and who in the summer-time live in the fields until it is dark again. And such a story is told in two words—mere existence.

The wheat fields were green and waving, and the Indian corn was just above the ground. The soil is rich and black, and the contrasting colors as the light strengthened brought out a landscape of unusual beauty. The hills to the north could now be seen.

By sunrise fewer peasants were seen in the roads and more in the fields. This was the season for cultivating the Indian corn. All the work is done by hand, and it was no unusual sight to see several hundred peasants scattered over the plain. They were working in groups of from three to thirty or even forty, men and women together, barefooted, of course. The babies were in the fields also, and they were left at one end of the field in which the mothers were working. Frequently a baby would be seen lying on the soft earth, shielded from the sun by some garment hung on a stake.

It would be difficult to estimate the number of men and women required to plant the corn and later to cultivate the fields in Roumania. The area planted to Indian corn is over 5,000,000 acres, or more than half the extent of the cornfields of the great state of Illinois or of Iowa. One can hardly picture in his imagination 60

per cent of the cornfields of Illinois being cultivated by men and women without the aid of machinery.

As the morning advanced we began to lose our passengers, for they dropped off here and there at the various stations. Yet we took on others, some in holiday attire bound for the exposition at Bucharest. An occasional peasant woman brightened up the scene with her fantastic aprons, one worn in front and another behind, so that you could not get away from her glory whichever way she might turn. On holidays and Sundays the peasant women wear huge moccasins of coarse leather.

Bucharest was reached early in the forenoon. It is a city of nearly 300,000 people, of many nationalities, and there is considerable in the way of "local color" that is of interest to the traveler. There is nothing to interest one seeking grain information, however.

Braila and Galatz, on the Danube, about 100 miles above the Black Sea, are the great shipping-points for grain. These cities have a population of 60,000 and 65,000 respectively. In the matter of storage elevators they had made marked progress ten years or more ago. In fact, they were the first cities to build fireproof, concrete storage bins or silos; and a prominent American contractor made a trip there to study the construction.

There are several big exporting houses at these ports, and large ocean steamers come this far up the Danube for loads of grain. While the Danube is navigable away up to southern Germany, and flows through Austria, part of Hungary and along its southern border, no wheat is shipped down it until southeastern Hungary and northern Servia are reached. From here on to the Black Sea it and its tributaries drain Servia, Bulgaria and Roumania, northeastern Austria and southwestern Russia; and the river is the great highway for exports.

CHAPTER IX.

THE MOUTH OF THE DANUBE.

From Galatz to the Black Sea—Navigation Controlled by a Commission—The Delta—A Great Marsh-Land—Work of the European Commission of the Danube—Improvements in the Channel—Grain Vessels That Come to, and go From, the Danube—Exports From the River—Sulina, at the Mouth of the Danube—An Isolated and Picturesque Town—Wheat Traffic Its Only Business.

At Galatz the Danube leaves behind all that has made it attractive. The grandeur of its mountains, the picturesqueness of its plains;—its agriculture, its cities and towns, and even its people are left behind. Its fleets of vessels, 100 miles of broad, grassy marshes and a unique and lonesome little town at its mouth, or rather at one of its mouths, are all this mighty river can now claim. Rather an ignominious ending for a river that makes such a pretentious start!

The navigation of the Danube from Galatz to the mouth is controlled and regulated by the European Commission of the Danube, with headquarters at Sulina, on the Black Sea. On January 1st, 1908, Mr. E. L. C. Magnussen, who had been assistant engineer, was placed in charge as resident engineer.

Forty-five miles below Galatz the river divides into two branches. The left-hand branch, the Kilia arm, with many turns and sub-divisions, flows into the Black Sea through seven narrow channels. The right-hand branch, the main stream, divides again ten miles below the first fork. The central or main channel runs east-

erly to the port of Sulina, on the Black Sea. The other branch winds sluggishly on to the southeast, under the eastern spurs of the great range of Dobrudscha hills. This is the St. George's arm.

An equilateral triangle is formed by these arms on the north and south and the Black Sea on the east. Each side of the angle measures about fifty miles in a straight line. The larger part of the tract thus enclosed is marsh, covered with a dense growth of tall reeds, interspersed with lakes and cut up by narrow lagoons into countless islands.

In the whole of this great delta there are only a few square miles of ground higher than the general level of the marsh, and there are two broad ranges of sand-dunes several miles inland, marking the line of the ancient seacoast.

Russia took possession of this region after the capture of Ismail—a town on the Kilia arm, in Bessarabia, in the early part of this century. In order to help commerce at home, Russia placed restrictions on the Danube trade that almost destroyed it for a time.

Great pressure was brought by England to induce Russia to remove the restrictions on the navigation of the Danube. International disputes arising from this cause finally culminated in the Crimean war.

One of the clauses of the treaty which followed that war, created a riverian commission, whose duty was to regulate the general navigation of the river, and another clause established the European Commission of the Danube, "to clear the mouths of the river, as well as the neighboring parts of the sea, from the sand and other impediments which obstruct them." The first of these commissions found its task impossible, on account of the

conflicting interests of the small countries along the river, and has never done anything, although recognized diplomatically.

The powers represented in the active commission are Great Britain, Austria-Hungary, France, Germany, Italy, Roumania, Russia and Turkey. Finally, by the treaty of 1878, it was settled that this commission should continue until dissolved by the Powers. It has been constantly at work since its first meeting, in 1856.

The improvements in the channel brought about by the commission caused a decided increase in the English trade of the river. Before 1847 from three to 52 English vessels entered the Danube annually. Between 1847 and 1860, 2,648 English ships entered the river, representing a net tonnage of 509,723. From 1861 to 1889 the traffic was increased to 12,363 vessels, with tonnage of 9,842,260. In 1861, 214 English sailing-vessels and 35 steamers came to the port of Sulina, and in 1889, 842 steamers and not a single sailing-vessel. In 1890 the total number of vessels of all nationalities entering the Danube was 1,519, including many steamers of 1,400 to 1,600 tons.

From January 1st to December 31st, 1906, the total number of steamers sailing from the mouth of the Danube was 1,195, and of sailing vessels, 154. The total tonnage represented was 2,275,812.

There were 12 steamers of over 3,500 tons each, as follows: 4 German with combined tonnage of 16,850; 6 Great Britain of 22,775 tons; one from Greece, 3,670 tons, and one Italian of 4,250 tons.

In 1906 one vessel from the United States appeared at Sulina. It was a sailing-vessel of 323 tons.

Many of the steamers go no farther than Sulina,

loading there from the barges that come down the Pruth or the Danube.

The amount of grain loaded at Sulina and the total amount that passed out of the Danube at Sulina in 1906, is shown in the following table, in bushels:

	Loaded at Sulina.	Exported from Danube.
Wheat	36,850,000	63,760,000
Rye	5,440,000	11,200,000
Corn	13,260,000	23,850,000
Barley	10,930,000	22,560,000

Navigation is seldom closed at the mouth of the Danube. Yet it was for a short time in the winter of 1906-07, which was unusually severe. At the same time the harbor at Odessa was frozen over.

The commission began in 1860 to collect tolls to maintain the improvements, and British ships paid from 71 to 82 per cent. of the whole dues levied from 1890 to 1900.

The work of the commission has consisted in the construction of groynes, revetments, straightening the river-banks, shortening the channel by cuttings, and dredging the shallow places.

The whole delta has been surveyed, and accurate maps made. A great part of the Sulina arm has been canalized, and the channel deepened from 8 feet at extreme low-water to over 16 feet, or to 20½ feet at average low-water. Every year the navigation of the Sulina branch has become less difficult and dangerous, and even ten years ago vessels of 2,000 tons steamed up as far as Braila.

SULINA THE UNIQUE.

Sulina is one of the most unique towns in the world, and one of the most desolately picturesque. It came into existence to supply a distinct need, and it is still a necessary factor in the grain trade of the Danube. On every Monday morning the grain markets are advised from Liverpool of the wheat shipments "from the Danube." This means from Sulina, although the grain comes from southwestern Russia, down the Pruth river, and northeastern Austria, from various parts of Roumania, Bulgaria and Servia. It comes to a common point here at the little town of Sulina, and then the importing countries of western Europe know what fresh supplies have been added to the amount on ocean passage.

The history of Sulina dates back previously to 1850, for as early as 1847 English sailing vessels came to the Danube for grain. Most of them anchored at the mouth of the Sulina branch, among the marshes; and here they discharged their ballast and loaded with grain.

The discharging of the ballast was the laying, not of the cornerstone, but of the foundation of Sulina; for otherwise it would have had none. A little settlement was started on the heaps of gravel deposited on the marshy banks; and as the years went by the accumulating gravel-heaps spread farther and farther inland. Streets and houses followed the expanding area of solid ground, until a permanent town was built.

The establishment of the European Commission of the Danube gave a fresh impulse to the place and a busy commercial town soon covered the deposit of ballast. Offices, large warehouses and repair-shops were built;

churches were erected, a life-saving station was established, a fine stone quay was constructed on the south bank of the stream, and two jetties with lighthouses were built far out in the shallow waters of the Black Sea.

Many steamers go no farther than Sulina, for they get their cargoes here from the barges that come down the rivers.

Sulina is out of the world except for the semi-weekly passenger boats and the great fleet of grain vessels. No railroad comes within many miles of it, nor ever can: the inhabitants, exiled here, have not this pleasing possibility to look forward to. They are forever debarred from going down to the station to see the trains come in. Nor can they see the passenger boats go by, for they pass in the night time. No long walks or drives are possible, and the honk of automobiles will never cheer the people, for the wilderness of reeds comes up to the very back doors of the town. There is a certain fascination in the isolation of Sulina, yet few travelers ever visit the place. Every traveler in that part of the country is eager to reach his destination, Odessa or Constantinople, if going out, or Galatz or Braila, if entering Roumania. Very few stop off at smaller cities than these two in Roumania, while the greater number regard Bucharest as possessing a pleasing sufficiency of inconveniences.

CHAPTER X.

INDIA.

An Uncertain Exporter—Great Area, Immense Population and Big Crops—Wheat Growing Provinces—The Crops—Acreage of Provinces—The Seasons—Drouth and Irrigation.

If INDIA never raised enough wheat to have a surplus for export, its position among the wheat-growing countries would be more harmonious—that is, viewed commercially. Owing to the great uncertainty of the crop, the importers of the United Kingdom never feel that they can rely on India for more than a small amount of wheat. Possibly nothing will come from there; or, on the other hand, 50,000,000, or 60,000,000 or even 80,000,000 bushels may be forthcoming. It would therefore be better, commercially, if it were positively known that India were altogether out of the list of exporters; for then there would not be a big surplus one year and none at all another to upset all calculations on the world's crop movement.

In 1903, after reviewing the exports for a series of ten-year periods, G. J. S. Broomhall, the Liverpool statistician, wrote as follows of India:

"This is not a very magnificent result after more than thirty years of effort, and our statesmen may be well advised not to expect in the future too much from this densely populated part of the empire, for after all British India is by no means of illimitable extent; and when compared with other divisions of the globe or even of the empire, it appears almost insignificant."

The contention is that the population of British India is so great as compared with the area that the consumption will keep pace with any increase in yield.

India is only one-third the size of Australasia or Canada, whereas it has a population about fifty times as great. In fact, the population is greater than the United States, Canada, Russia in Europe, Australasia and Argentina, although its area is only 8 per cent. thereof; and when contrasted in both respects with Argentina alone, as follows, it is suggestive:

	Area, acres.	Population.
Argentina	714,000,000	4,500,000
British India.....	630,000,000	231,000,000

From 1893 to 1903 inclusive India did not export 30,000,000 bushels during any year with the exception of the season ending March 31, 1899. Following that 10-year period, the exports increased and for the crop year April 1, 1904, to March 31, 1905, the exports amounted to 80,640,000 bushels. In 1907-08 they were small, and for the crop season beginning with April 1, 1908, no exports are expected. Therefore, the disconcerting factor that India is in the markets of Europe is quite apparent.

It is worthy of note in this connection that even in crop-failure years—famine years—India can hardly be called an importer. The imports of wheat have never amounted to over 1,000,000 bushels in any one year.

Although wheat is grown to some extent all over India, even as far south as the province of Mysore, thirteen degrees north of the equator, the great wheat area is in the Punjab, in the northwestern part. From the extreme northwest, a line drawn to the southeast across 1,200 to 1,400 miles of country, through the Punjab and

Northwestern Frontier provinces, the United provinces of Agra and Oudh, and through Bengal, would cross nearly two-thirds of the wheat area of India. Yet it would not get out of the British provinces. This is a territory as great in extent as from New York City to the Mississippi.

India is the fourth wheat growing country of the world, and the crop is approximately 300,000,000 bushels. In 1903 the crop was estimated at 304,320,000; in 1904, 360,000,000; 1905, 280,000,000; 1906, 320,000,000; and 1907, 317,000,000.

The exports from the 1904 crop, from April 1 to March 31 following, amounted to 80,640,000 bushels.

The wheat crop of the various provinces as officially estimated for the years mentioned is shown in the table that follows. The amounts are in long tons (37.33 bushels to the ton). The estimate for the native provinces given in the table as Central India, Rajputana and other provinces, may be questioned, for the reason that there is no systematic method of gathering statistics in the native provinces. The table follows:

Official returns of the wheat crop, amounts in long tons, 37.33 bushels to the ton:

	1907.	1906.	1905.
Punjab	3,250,000	3,510,000	2,855,000
N. W. Frontier Provs.	300,000	280,000	268,000
United Provs. of Agra-Oudh	2,125,000	2,429,000	1,897,000
Bengal and E. Bengal	430,000	450,000	495,000
Cen. Provs. and Berar	900,000	827,000	832,000
Bombay	200,000	271,000	357,000
Sind	160,000	193,000	126,000
Central India and Rajputana	1,135,000	560,000	662,000
Other Provinces	.....	40,000	90,000
Total	8,500,000	8,560,000	7,582,000

Acreage and estimated crop of wheat in British India and the native states mentioned, for the crops harvested in 1901 and 1902, follows:

(From the "Agricultural Statistics of British India.")

Provinces and	1901.		1902.	
* Native States.	Acres.	†Tons.	Acres.	Tons.
Punjab (including N. W. Frontier Prov.)	9,080,000	3,028,580	8,023,600	2,005,579
United Provs. of Agra and Oudh	6,790,440	2,384,605	6,479,720	2,401,940
Central Provinces	2,055,736	440,909	2,590,209	561,574
Bombay	1,433,810	298,479	1,333,816	168,971
Sind	479,487	123,160	495,613	102,132
Berar	243,554	5,093	280,085	6,180
Bengal	1,498,700	472,600	1,388,200	391,000
Rajputana	713,290	170,682	541,834	103,869
Central India	1,244,330	220,116	1,460,044	256,214
Nizam's Territory	748,163	15,068	712,157	13,184
Mysore	255	197	3,714	256
Total acreage	24,290,066	7,159,489	23,308,992	6,010,899

* Acreage figures for native states are unreliable.
†Long tons, of 37.33 bushels.

The season of wheat sowing in India has a wide range. In the Punjab, while October is the normal time for seeding, it is carried on from September to January. But when seeding is not begun in October, the area sown is not so great nor is the yield so heavy. If the rains do not come in the autumn, the crop outlook is unfavorable from the outset; and if November passes without rains, the situation is regarded as serious. During the season of 1907-08 little rain fell before the second week of January, 1908.

In other parts of India wheat seeding is done as follows: Northwestern Frontier provinces and Oudh, September to December; Bengal, and Central, the same; Bombay and Sind, October to December, Rajputana, Sep-

tember to December, and the others from September to November.

Harvest-time is from February in the most southern provinces to April in the northwest.

Wheat from the new crop movement is received freely in the United Kingdom from Bombay in June, and from Kurrachee in July. The latter is the principal export port.

The cause of short crops in India is, as is generally known, drouth. There is scarcely a season in which some part of the country is not afflicted and in which there is not consequent famine. When the autumn rains come in sufficiency in the great northwest country, a good crop is practically assured.

Yet the deficiencies of the climate are in part made up by irrigation. The British government has done a vast amount of work in this direction.

The Punjab is given as the best example of irrigation works. Writing on this subject, Charles M. Pepper, foreign trade commissioner of the United States Department of Commerce and Labor, says:

"The area of the agricultural region between the Indus and the Jama (the eastern boundary of the Punjab) is about equal to the state of Pennsylvania. The average rainfall is only twenty-two inches, and without artificial aid its productive capacity would be definitely limited. Its life-blood is the Sirhind canal, 550 miles long with more than 4,600 miles of distributary branches. A vast network of interlacing canals distributes the waters of its snow-fed rivers over the billiard-table surface of its once arid plains. In 1907, 6,300,000 acres had yielded to the spell of irrigation as against 2,341,000 in

1887. The cotton area is approximately 1,400,000 acres; wheat, 8,000,000; other cereals, 9,000,000; rice, 600,000; and sugar cane, 350,000.

"After the Punjab comes the geographical continuation known as the Sind. Its sustaining stream is the Indus, with the water waves on the surface and the waves of sand on the bottom jointly shaping its course. The Indus from its source in the Tibetan Himalayas to the gaping mouths which it opens to discharge through the Delta into the Arabian sea, is 1,800 miles long and its basin covers an area equal to the state of Texas. There is an area of 30,000,000 acres of which 14,000,000 is capable of cultivation if water can be obtained. Four million acres is yet to be 'commandeered,' that is, brought within the sway of available engineering resources."

The Sind in 1896 had 2,562,000 acres under productive irrigation; in 1906, the area was 3,192,000. With a cotton acreage of 250,000 it has produced 125,000 bales of 500 pounds each.

The total irrigated area of the Indian empire under control of the state is approximately 43,000,000 acres of which 19,000,000 is from canals, 6,000,000 from wells, 10,000,000 from reservoirs—"tanks"—and 8,000,000 from other sources. Private irrigation works water an additional 26,000,000 acres.

It seems probable that the irrigation works, which are doing much toward the more equable distribution of moisture, will bring about steadier crop yields,—less violent fluctuations in the amount produced. But it seems hardly probable, in view of the great population, that the country will become a heavy exporter only in seasons of exceptionally large crops.

CHAPTER XI.

AUSTRALIA.

Small Crops but Important Exporter—Drouth and Crop Failures—Not a Good Record—Crops of the Commonwealth—Australasia—Crops and Exports.

With a normal crop, when conditions are favorable, of only 55,000,000 bushels, Australia is of nearly as much importance in the markets of the importing countries as India with its crop of 300,000,000. This, of course, is because of the small population of Australia and the relatively large exports. Australia alone (not including New Zealand, both of which make up Australasia) has raised close to 80,000,000 bushels of wheat, and has exported nearly 40,000,000. The bread and seed requirements of Australia are estimated at 28,500,000 to 30,000,000 bushels, whereas India has little to export even when the crop is 300,000,000.

Yet Australia stands with India in the matter of crop uncertainty, and its short crops are from the same cause—drouth. In the last fifteen years Australia has had many crop failures and has had to import wheat. The harvest of December, 1902, was almost a complete failure, and throughout the following year the country bought wheat and flour freely in Oregon and Washington, and even came as far as Minneapolis for large quantities of flour. All the surplus of Washington and Oregon was bought for Australia, and the demand was so great that prices advanced in the Pacific coast states out of all proportion, relatively, with other markets.

Drouth, by the way, is something a country does not fully overcome nor ever outgrow. Every new wheat-growing country has had many things with which to contend, and nearly everything but drouth has been met and outgrown. Frosts before the grain had ripened, for instance, in the Northwestern states was at one time greatly feared. Parts of Northwestern Canada are now going through the early-frost period. Many insect pests likewise afflict new countries, but are finally outgrown. But a dry country will send down drouth periods upon the grain fields, despite years of agriculture, that will fairly burn up the crops. The semi-arid region of eastern Russia has them, and so does India and Australia and a semi-arid strip from Saskatchewan to Texas.

The record of Australia in this respect is not a good one. In 1893 a crop above the average was raised. Then followed three years of crop failures. In 1897 the crop was scarcely an average yield. Three years of crops above the average followed. In 1901 there was a bare average, and 1902 there was a failure. The 1903 crop was a big one; 1904 was above the average; 1905 considerably above, and 1906 was the record year in which Australia raised over 75,000,000 bushels of wheat. Then came another drouth season, and the crop harvested in December, 1907, fell to approximately 45,000,000 bushels.

While a dry country returns to its drouth periods, although it may have a series of three, four or even five seasons of sufficient rainfall, and while crops cannot be raised without rain, a fair yield can be secured even in dry years by intelligent and systematic farming methods. In the drouth region of Russia, of course little is to be expected from the peasants in the way of improved methods. Neither is there in India; while ab-

solutely nothing in the way of hard work and systematic farming can be expected of the "settlers" in Argentina.

But in Australia there is something to be hoped for in this direction, and in the careful preparation of the soil fair crops may be raised in seasons of insufficient rainfall. And so, while the country cannot overcome nor outgrow the drouth, it may so adapt itself to it that the crop failures of the past will be modified to "fair" yields in the future.

From the position of the importing countries, therefore, Australia should be regarded hopefully; not, perhaps, as promising so much as Canada or Argentina, but as next in line.

The following table, which gives the amount of wheat raised in three good seasons, shows the relative importance of the several states:

	1906. Bushels.	1905. Bushels.	1903. Bushels.
New South Wales.....	26,000,000	20,737,200	27,334,141
Victoria	26,286,000	23,417,670	28,525,579
South Australia	19,800,000	20,143,798	13,209,465
Queensland	2,000,000	1,137,321	2,436,799
Western Australia.....	2,500,000	2,293,333	1,876,252
Tasmania	775,000	752,875	767,398
Commonwealth.....	77,361,000	68,482,197	74,149,634

In addition to the crop of the Commonwealth, New Zealand raises 7,000,000 to 8,000,000 bushels of wheat, and this is included in the world's crop figures under Australasia.

Australia is a considerable exporter of flour as well as of wheat to South Africa. The greater part of the wheat exported, however, goes to the United Kingdom, although Germany, France and Belgium receive some.

Grain shipments begin to arrive freely in Europe in April, a month later than the first free arrivals from Argentina.

Seeding in Australia is in May and June, and harvest is in December. Harvest in New Zealand is six weeks later.

The crop figures for Australasia generally accepted in the world's statistics are as follows for a series of years, in bushels:

	Crop.		Exports, Australia only.
1907-8	*45,000,000	1907	29,400,000
1906-7	80,000,000	1906	34,000,000
1905-6	68,675,000	1905	30,750,000
1904-5	58,400,000	1904	40,000,000
1903-4	75,000,000	1903	Imported
1902-3	20,000,000	1902	9,000,000
1901-2	42,000,000	1901	20,260,000
1900-1	58,400,000		

* Estimated.

CHAPTER XII.

FRANCE.

The Third Wheat-Growing Country—A Big Crop Consumed at Home—Small Importer and Unimportant Exporter—Crops and Imports—Wheat-Growing Area—Large Average Yield—Tendency Toward Smaller Acreage and Larger Yields—High Tariff—Effect of Import Duty—Advantages Given Millers—Wheat Prices in France and England Compared—French Agriculture—Co-Operation and Prosperity—Characteristics of the Agriculturists—Remarkable Traits of Frugality.

FROM the exporting countries we will now turn to those whose crops are insufficient for their own requirements, leaving the great wheat fields of Argentina, Canada and the United States until the tour of Europe shall have been completed.

France, the third wheat-growing country, occupies a peculiar position in the commercial grain world. Yet, among the wheat exporting and the importing countries its influence is less than that of some countries whose crops are much smaller. The crops, the grain trade and the milling business, while of the first importance to France, are almost entirely of a local nature,—they are for the people of France. The country imports some wheat every year and exports some flour. It has no important grain markets, for the country is thickly populated and there are over 2,300 mills, mostly small, scattered throughout the wheat-growing departments or states. Big central markets are therefore unnecessary. The great wheat crop, averaging, of late years approximately 325,000,000 bushels, is so nicely balanced to the

bread requirements of the country that, in normal seasons, it is necessary to import only 8,000,000 bushels more than is exported in the form of flour. In years of unfavorable crops the net imports are much heavier.

Wheat from other countries is not permitted to come in competition with the home crop. It is shut out by an import duty. It is only when there is a short crop that France has an important outside influence. Then the tariff comes down and prices in all other countries advance; and when France has absorbed sufficient supplies to make up its deficiency, like the shell of a clam it closes up again and shuts out the rest of the agricultural countries.

While the country is not of great importance in the international wheat trade and is usually an insignificant factor in the markets, it is perhaps the most interesting and important of the wheat-growing countries in other respects. For instance, there are its agricultural methods —"intensive" cultivation of the land whereby large and steadier yields are obtained; then there is its wonderful industry and thrift, and an economy of lands, the cultivation of every inch, that would astonish an American farmer. Co-operation among the agriculturists is another feature of interest; for in France, as in Germany, it has brought about many reforms and has decidedly advanced the level of agriculture.

A branch of the grain trade, if it may be so called, that has been brought to a high state of efficiency in France, is that of statistics. With the exception of England there is no other country where grain-trade statisticians have reached the point of excellence they have here. In one particular, however, France has been and still is

behind other progressive countries, and that is in flour milling.

The amount of wheat raised in France for a series of years is shown in the table that follows, in bushels:

1907	373,600,000	1903	365,000,000
1906	327,200,000	1902	352,700,000
1905	337,600,000	1901	304,000,000
1904	297,600,000	1900	325,600,000

The gross imports of wheat together with a little flour, and the net imports, after deducting the amount of flour exported, were, for several years, as follows, in bushels:

Aug. 1 to July 31.	Gross Imports.	Net Imports.
1906-7	41,400,000	.....
1905-6	33,600,000	.....
1904-5	38,200,000	.....
1903-4	32,800,000	.....
1902-3	40,200,000	23,760,000
1901-2	31,100,000	8,000,000
1900-1	25,900,000	8,000,000
1899-0	26,300,000	5,000,000

For the twelve months following August 1st, 1897, the net imports of wheat were 81,000,000 bushels.

There will occasionally be a short crop in France as a result of very unfavorable weather conditions. France is not blessed with the best of climates, particularly during the winter months. Then, too, the crop has periods of great heat to undergo in July.

The wheat is sown in the autumn, and the quality is not regarded as of the best. It is of the soft varieties. The crop is harvested in July except in the south of France, where it is cut in June.

Wheat is grown over the greater part of France, and, in a general way, the wheat area may be said to be 500 miles in extent north and south by 200 to 350 miles east and west. Yet the greatest wheat-growing district is the northern central part of the country. In that region the yields are often very heavy, forty or even fifty bushels to the acre.

A peculiar method of sowing wheat obtains toward the southwest, in the departments toward the coast. Here the wheat is sown on ridges raised by furrowing the ground. The ridges are of such distance apart that a harvester will cut the grain on two at the same time. The ground is cultivated in the furrows, and heavy crops are grown.

France has a high average yield per acre of wheat. In good seasons the average for the entire country is well above 20 bushels. The big crop of 1903, which was 365,000,000 bushels, was raised on 16,144,000 acres. This was an average of 22.6 bushels per acre. In 1901 the average dropped to 18 bushels.

There has been a gradual tendency since 1868 toward a smaller wheat acreage and higher average yields. Even as far back as 1860 the area in wheat was greater than in 1907, but the crop was materially smaller. From 1860 to 1880 a crop of 300,000,000 bushels was the exception, although the area was from 16,600,000 to 17,300,000 acres. In 1868 it was even 17,440,000 acres, and again in 1889.

Since 1893 there has been rather a steady decline in the area in wheat, but an increase in the size of the crop, except, of course, in unfavorable years. Since 1902 the acreage has been well under 17,000,000, in 1903 dropping to 16,145,000.

THE IMPORT DUTY AND ITS EFFECT.

In 1885 the friends of agriculture were influential in getting the import duty on wheat raised from almost nothing to 15.7 cents a bushel.

Now, the effect of an import duty on wheat can, of

course, be calculated in advance, in a general way, from a theoretical basis. Either the duty will exclude foreign wheat, or, if imported, the consumer will pay the whole duty on the amount brought in and part of the duty on the wheat raised at home. The wheat-grower is proportionally benefited in any event.

France and Germany are good examples of wheat-growing countries that are also importers, whose agriculturists are protected by a duty on wheat. Hungary occupies a somewhat different position, for its millers desire to import cheap wheat that they may export the flour. Hungary is not an importer for its own consumption.

France, as already mentioned in this chapter, imports wheat for domestic consumption, but also that its mills may export flour. Provision is made for this; for the French miller is permitted to import wheat free of duty provided that he exports the equivalent in flour. Yet the flour need not be from the wheat imported. He may import American or Russian wheat and export flour from French wheat.

The same privilege is granted the millers of Germany. The millers pay the duty, but get it back by means of a "drawback." It is not required of the millers in France or Germany that they either export the mill-feed from the imported wheat or pay the duty on it. In the United States this is required of millers, and, furthermore, they must grind the imported wheat in a bonded mill and export the product of that identical wheat. They must even account for the dust that is blown out of the grain in process of manufacture. Thus does official red tape make a farce of a law! If the law

is good, the millers should have the advantage of it; if bad, it should be repealed.

In Hungary the millers were permitted, some years ago, to import wheat free of duty provided the flour were exported. But this privilege was withdrawn and the duty was increased. The agriculturists hoped thus to advance the price of wheat at home; but Hungary raises more wheat than is consumed within the country (or by Austria-Hungary). For this reason the duty has little effect on the price of wheat except in short-crop years. Then, as was illustrated in 1907-08, following the crop failure of the summer of 1907, the duty—all or in part—is added to the price. That is, in a short-crop season at times the prices in Hungary will be 18 to 19 cents (the duty is 19.5 cents) higher than across the line in Roumania or Servia.

In the summer of 1906 when the writer was in Budapest the price was only about two cents above the New York price. In France and Germany, however, the price was approximately the London price plus the duty of 36.8 cents and 32.3 cents respectively.

Of course, the wheat growers of France and Germany do not get the full benefit of the duty on their entire crop. But the consumer pays the full duty on all the imported wheat that is not exported again.

A careful study of this question in relation to France, by Mr. Broomhall, publisher of the Corn Trade News of Liverpool, resulted in the compilation of some figures. It appears from his investigations that since 1870 the English prices have been lower than the French, the latter at first increasing relatively as the duty was raised. Going back only to the time when the duty was advanced, we find that for the season of 1885-6 the French

price averaged 19.3 cents a bushel higher than the English. From 1887 to 1891 it averaged 33.5 cents higher; in 1892, 33.7; in 1893, 34.2; from 1894 to 1897, 31.5 cents. For three months in 1898 wheat was imported free, but for nine months, the French price was 35 cents a bushel higher than the English. From 1899 to 1902 the average was 26.6 cents higher.

These average prices are not altogether satisfactory, however, for it is probable that during the months when the farmers were selling grain most freely, the French price was not materially higher than the English.

A somewhat different showing would result from comparisons of German and English prices, for the reason that Germany imports more and raises less wheat than France.

Before leaving this subject it may be said that following the short crop of 1904 in Minnesota and the Dakotas, the price of wheat ranged some 15 cents a bushel higher in North Dakota than just across the line in Manitoba for the same grade of wheat. At one time the difference was almost 25 cents, which is the amount of the duty. At the same time the price in New York was so much above European prices that an exporter in Roumania was on the point of sending a cargo of wheat to New York. Only a difference of one cent a bushel prevented the negotiations from resulting in an actual sale.

AGRICULTURAL CO-OPERATION.

Only brief mention can be made here of agricultural co-operation in France, which, like other western European countries, suffered a great decline along toward

1880. Systematic organization was begun early in the eighties, and improvement in conditions since then has been marked. An account written by M. le Comte de Rocquigny in 1884 of the condition of agriculture that brought about profitable organization and co-operation, seems of sufficient interest to quote briefly from, as follows:

"After having enjoyed a long period of prosperity, our agricultural producers began to suffer experience of which no one could see the end. The French market, which, by reason of the development of the means of transport, was no longer protected by the natural barrier of distance, began to be flooded with foreign commodities produced at a cost that defied all competition. Our lands, exhausted by centuries of cultivation, had no chance against the productions of virgin soils, or of countries more favorably situated in regard to taxation, cost of labor, etc. * * *

"It was necessary to organize for the struggle, to realize promptly all the possible opportunities for progress, to decrease the cost of production, and to improve the methods alike of production and of sale. For the attainment of these ends the old agricultural associations were but ill-prepared. It no longer sufficed merely to spread technical knowledge and to give prizes and awards to agriculturists at periodical exhibitions."

One of the first benefits to be derived from systematic co-operation was in the use of fertilizers. Up to this time there was great difficulty in getting the peasants to use the fertilizers that agricultural chemistry was offering them, for their impoverished lands. But a professor of agriculture at Blois evolved the plan of getting all the farmers in a certain district to join in sending in one big order, by means of which they would be able to purchase at a less price, get lower railway rates, and

also be in a better position to secure a guarantee of quality. A combination with these objects in view was brought about, and when organizations of this type acquired a legal status in France, in 1884, many more such purchase associations followed. The use of the fertilizers was found to yield increased crops at a reduced cost, and the operation of the new organizations obviated all the difficulties previously encountered. So the movement for the establishment of agricultural societies spread, in course of time, throughout the whole of France, and in proportion as their utility was recognized, the scope of their activity widened. Seeds and feeding-stuffs were purchased in wholesale lots. So were tools and agricultural implements of various kinds, while special syndicates either procured agricultural machinery too costly for individual farmers to get for themselves and let it out on hire, or enabled farmers to purchase on special terms.

That was the beginning of better days for the French agriculturist.

THRIFT IN RURAL FRANCE.

Some mention of one of the dominating traits of the people who cultivate the land may not now be out of place. The traveler in rural France is perhaps most strongly impressed with the economy practiced in everything in connection with agriculture. An American, accustomed to wastefulness of lands and forests and of labor, is first astonished and then he is thoughtful. For example, if it is the season when the trees by the roadside are trimmed, the traveler will notice that nothing is wasted. Even the smallest twigs, scarcely big enough

to build a bird's nest with, will carefully be gathered up and tied in bundles. These will be sent to the cities for kindling-wood. The country roads are kept free of everything that can be utilized for any purpose. These are but indications of the frugality of the people; and the fields are cultivated on the same principle.

But to bring out more strongly this trait of frugality, the following extract is given from a very excellent work by Edwin A. Pratt, of London. This has reference to the west coast, where gathering berries for the market has developed to considerable importance. Mr. Pratt writes:

One English dealer telegraphed to St. Malo saying that he would take 200 tons of blackberries, if he could get them.

By what means are these hundreds of tons of blackberries got together in this one particular corner of France? There is no horticultural syndicate there to promote the culture of blackberries, or to organize the sale thereof; but those said tons are collected and sent off all the same, the persons chiefly concerned being women and children. The peasantry throughout Brittany know that there is money to be made by picking blackberries to send to England, and every few days during the season—especially on Thursdays, the school holiday—the women and children of a household will turn out with their tins and basins, and gather what blackberries then can. These they put together, and take in the afternoon or evening to some village tradesman—no matter in what line of business he may be—who owns a horse and trap, and has dealings with St. Malo. The tradesmen will give at the rate of about eight centimes (5 centimes to 1 cent) a pound for the blackberries, and as every centime has its value in the eyes of the essentially thrifty French peasant, the money thus earned represents an acceptable addition to the weekly income.

As for the tradesman, when, probably, most of the families in the village are out collecting, he may expect to have a good supply by the evening to take to the wholesale exporter at St. Malo, from whom he will receive a price that gives him about two centimes per pound profit.

Applying this method of collection to practically every village or hamlet within a radius of, say, a dozen miles of St. Malo, one will cease to wonder how it is that the French wholesale fruit merchant manages to get together blackberries by the ton for consignment to the English market. As for the peasantry, their receipt of eight centimes per pound for picking 773 tons of blackberries during the season means that the business put into their pockets no less a sum than £5,541.

The writer adds that just as good blackberries are to be found in Cornwall, but that the English "fail to show the same amount of energy and enterprise" as the French, and will not pick them for market.

While this is rather a wide digression from the subject of wheat, it nevertheless illustrates a striking characteristic of the people who are perhaps the best agriculturists in the world.

CHAPTER XIII.

OTHER COUNTRIES.

Algeria—Tunis—Portugal—Spain—Greece—Egypt—Morocco—Brazil—Cuba—Chili—Uruguay — Mexico — Switzerland — Denmark—Norway—Sweden.

A DIGRESSION will be made here for a brief mention of a number of countries in various parts of the world, which, owing to their small importance in the commercial wheat world, may be grouped for convenience and to try the patience of the reader less.

The two North African colonies of France, Algeria and Tunis, are of some importance to France, as their surplus is admitted free of duty. Algeria sends 4,000,000 to 5,500,000 bushels of hard wheat to France annually. It is mainly used for the making of macaroni. The quality is good, but inferior to the best Russian wheat.

Algeria raises 24,000,000 to 44,000,000 bushels, including some soft wheat. Harvest is in May and June, and seeding in September and October.

Tunis raises from 6,000,000 to 10,000,000 bushels. Harvest is in May, and seeding in September and October.

Portugal raises a crop of from 6,000,000 to 10,500,000 bushels of hard, flinty wheat, which makes a poor quality of flour.

The importation of flour is prohibited, while wheat is protected by a duty of 37.2 cents a bushel. The imports of wheat average about 4,000,000 bushels annually.

Spain is an importing country, though of no great importance. Although there is a heavy duty on flour, a

small amount is imported. The wheat imports are irregular. During a four-year period including 1890 and 1893, the average annual imports of wheat and flour were 10,000,000 bushels. From 1899 to 1902 the average was but 5,000,000 bushels. In the year 1899 the country imported 14,700,000 and in 1900, 8,300,000 bushels. The millers of the country prefer, for importation, the hard or durum variety from Russia. The wheat raised in Spain is largely of this variety.

Statistics from different sources on the crop of the country vary, which leads to the conclusion that the figures are mere approximations. For the last eight years the total yield has been estimated at from 85,000,000 to 124,000,000 bushels.

Greece raises from 3,500,000 to 6,000,000 bushels of wheat and imports about 6,000,000 bushels.

Egypt raises 8,000,000 to 12,000,000 bushels, and is now an importer. The imports are mainly in flour, and amount to 1,750,000 to 2,500,000 bushels of wheat.

Morocco, Tripoli and South Africa are unimportant either in the amount of wheat grown or the wheat and flour imported.

Brazil imports somewhat over half a million barrels of flour annually from the United States, but its breadstuff wants are principally supplied by the Argentine.

Cuba uses half a million barrels of flour from the United States annually, and a considerable amount of cornmeal.

Chili raises from 8,000,000 to 13,000,000 bushels of wheat, and whereas it at one time sent four to five millions annually to Europe, its exports are now almost nothing.

Uruguay, now a small grower of wheat and a small

exporter, shows some indication of increasing its crop. Its exports for 1908 are estimated at 6,000,000 bushels. The entire crop has been ranging from 6,000,000 to 10,000,000 bushels. But it may be that the wealth brought to its big neighbor on the south and east, Argentina, has had an influence.

Mexico imports less than a million bushels of wheat, and its crop varies from 6,000,000 to 16,000,000 bushels.

Returning to Europe, we come to the prosperous little live-stock and summer-tourist country of Switzerland. This country raises 4,000,000 bushels of wheat and imports 11,000,000 to 16,000,000 bushels. The annual consumption per capita is six bushels.

Denmark, the dairying country, raises two to four million bushels of wheat and both imports and exports. The net imports are from 1,500,000 to 3,500,000 bushels a year. The average yield of wheat to the acre is very large in Denmark. For different years it has been 21 bushels, 30, 41, and 21 again, respectively.

Norway raises less than half a million bushels of wheat and practically no rye. The imports are from 250,000 to 400,000 bushels of wheat, half a million barrels of flour, 1,000,000 bushels of rye and half a million of barley.

The duty is 47.5 cents a barrel on flour, 4 to 6.7 cents a bushel on wheat, 1.2 cents on barley, while rye is admitted free.

Sweden raises 4,000,000 to 6,000,000 bushels of wheat, 20,000,000 to 24,000,000 of rye and 13,000,000 to 15,000,000 of barley.

The imports are 5,000,000 to 8,000,000 bushels of wheat and 100,000 barrels of flour. Flour imports have

declined materially. But a few years ago the annual imports sometimes amounted to 400,000 barrels.

The duty on flour is $1.40 a barrel, and on wheat, 25.5 cents a bushels.

CHAPTER XIV.

ITALY.

Crop is Sixth in Size—A Regular Importer—Remarkable Cultivation—No Land Wasted—Terracing the Hillsides—Irrigation—"Retail" Farming.

ITALY occupies sixth place among the wheat-growing countries, though a good crop will place it in fifth place and Hungary in sixth if the latter country has but a moderate crop. Argentina, however, is crowding both these countries for fifth place.

But the importance of Italy depends upon the amount of wheat imported, which, in turn, varies with the size of the home crop. Italy has no markets of importance.

The official crop estimates of the country vary considerably from the figures often published in America. In the table that follows of the wheat crop of Italy the figures for 1900 to 1903 inclusive are official, while those of the last four years are taken from American records.

Wheat crop of Italy, in bushels:

1907	184,000,000
1906	160,000,000
1905	160,000,000
1904	150,000,000
1903	179,000,000
1902	127,100,000
1901	152,300,000
1900	130,000,000

The area in wheat ranges from 12,000,000 to 13,000,000 acres. Wheat is sown in the autumn and harvested in June.

The average yield per acre is well above 20 bushels.

Italy imports an average amount of 35,000,000 bushels of wheat annually.

A duty of 36.8 cents per bushel prevents the importation of much more wheat than the actual consumptive requirements, excepting when the price is very low. In 1905 the importations amounted to 32,000,000 bushels, mostly from Russia; in 1906, 45,600,000 and in 1907, 43,775,000 bushels. In 1903 they were 47,500,000 bushels, also principally from Russia. In the latter year the millers imported more hard Russian wheat than actually required, to mix with the native soft wheat to improve the quality of their flour. The semolina mills of Italy imported considerable amounts of durum wheat from the United States during the latter part of 1905. The annual imports of durum wheat amount to some 15,000,000 bushels per year. United States exports of durum wheat to Italy depend upon the Russian crop.

The more one sees of agriculture in Europe, and notes the results, the stronger becomes the conviction that "farming" in America is crudely done. Particularly is that true of wheat raising. Italy is a striking illustration of the opposite side. The country grows, in a good year, as much as an average crop in Minnesota and the Dakotas; but the traveler in Italy is continually wondering how and where it is done.

Italy is also the answer to the often repeated inquiry, "Has America nearly reached its limit as a wheat producing country?" For Italy raises millions of bushels where, in America, in similar localities, the ground is as yet untouched by the plow. How is it done? Just as France raises a large part of its best grapes, and as Switzerland supports a population that would otherwise

be an impossibility—by terracing the hillsides and the mountains to heights and angles deemed safe in America only by goats.

Furthermore, the fields are irrigated in a systematic manner. Water is not wasted in big ditches, but is used carefully; and irrigation is possible here and in France where it would not be in America. One land-owner, if he does not want water, cannot prevent others farther on from having it; he is compelled to permit a ditch to cross his land for the benefit of those who do want it; and he must pay his percentage, too.

Besides the closer cultivation of the ground, the yield per acre is also a very important factor. How much this may be due to the varieties of wheat grown, opens another question. Still, in experiments in England it was shown that the wheat yield on unfertilized lands decreased over 100 per cent. from what they had been yielding when fertilized.

According to a report by Counsul-General Castro, from Rome, the yield per acre in Italy was as follows, from 1900 to 1904: 20.34, 27.12, 22.82, 29.30 and 23.28 bushels respectively.

Comparisons are not altogether fair, however, unless all conditions are similar. In America farmers are in the wholesale business. Farming is done for profit. In Italy thousands of farmers, or peasants, are scratching a living out of the ground, where in America, on the same amount of land, a few hundred farmers have become or are becoming wealthy. One may safely assume that the large average yields in these small European countries, and the total acreage as well, whether grain, vegetables or fruit, is due to the dense population.

To turn for a moment to the possibilities of wheat-

growing in the United States, judged by what is being done in Europe, it seems reasonable to believe that the crop in America may be doubled. This however, will only be when it is required for domestic consumption; when the big farms are divided into smaller ones; when wholesale farming gives way to retailing. It hardly seems probable that the United States will ever be an importer of wheat to feed its own population. Yet it may import as France does—to manufacture and to export an equal amount of the product.

Contrary to what one excepts in Italy, the northern part is not the principal wheat-growing area. In some years the Rome district produces the most wheat.

Italy is a large consumer of wheat, requiring about 175,000,000 bushels per year, which includes seed. The average consumption per capita is estimated at 147 kilos or 5.37 bushels annually.

CHAPTER XV.

GERMANY.

A Great Wheat Importer—Agricultural Versus Industrial Interests — What Each Offers — Crops and Consumption of Wheat and Rye—High Yields—Uncertain Seasons—Imports of Grain — Import Duty Increased — Concession Granted Exporting Millers—Advancement in Agriculture——Agricultural Instruction — Financial Difficulties and Credit Banks.

We now come to the great importing group, the countries that consume vastly more grain than they raise, taking, in fact, the surplus of the world, and importing it by the hundreds of millions of bushels. What Russia, America and Argentina are among the grain exporting countries, Germany, Belgium, Holland and the United Kingdom are among the importing. And these countries are as influential in making the price as is America.

Of this group of heavy importers, Germany occupies a position second in importance only to the United Kingdom. And yet the position of Germany is not fully established; for the cities are rapidly growing, the importations of wheat have steadily increased for twenty years and are now at their greatest; the average consumption per capita of white flour is increasing, and the country is growing faster commercially than agriculturally.

There are, in fact, two mighty opposing forces in Germany—the agricultural and the industrial interests. The latter have on their side success and prosperity due to development of the world's markets. Furthermore, they have the best intellects of the empire—men who

have carried German commerce around the world and have made Germany feared, commercially, by every other nation.

The agricultural interests have a majority in the reichstag, and seem to have better politicians in their forces than their opponents. The agricultural interests are represented by the agrarians, the dominant national influence. They are for forcing Germans to eat only German products, as far as possible, no matter what the price may be.

The commercial and manufacturing interests, instead of living off one another, would bring the gold of all other nations to Germany, in exchange for German goods. They would make the country the greatest of the world's powers.

The agrarians, by means of the tariff, give to the farmers higher prices for grain and cattle. Yet the farmers cannot afford to pay living wages to laborers. There is a general complaint in the farming districts that the laborers are leaving the farms for the factories of the towns and cities. Eastern Germany is forced to bring in the miserable labor of still farther east to work on the farms.

The manufacturing interests offer the laboring classes more than they can get on the farm. Of course, there is little inducement for laborers, when looking at the future, to remain on the farms, for there is no hope of becoming a land-owner, while comparatively few may even rent the land.

Of course, much of Germany is fertile and large crops are raised. Yet a considerable part of it is not suitable for profitable agriculture. That the low wages paid in the factories are better than those paid on the

farms, would seem to indicate that raising the high-priced grain of Germany is expensive.

If the official figures on acreage and crops are correct, and it may be assumed that they are approximately so, the yield of wheat per acre is over double that of America. It averages from twenty-eight to thirty bushels an acre for the entire country.

This is surprising in the extreme when one sees the soil on which much of the grain is raised. Very large areas are sandy, and would be regarded good only for corn in America. Yet, with the necessarily low yields on such soil, that there can be high enough yields in sufficient territory to bring the average up to almost thirty bushels an acre, is difficult for an American to realize.

Germany raises a large crop of rye and only a moderate crop of wheat; and the consumption of rye per capita is also in excess of wheat. It is estimated that the average annual consumption per capita is 200 pounds of wheat and 325 pounds of rye, or a total of over 8.7 bushels.

The following table shows the production of wheat and rye for a series of years, in bushels.

	Wheat.	Rye.
1907	104,000,000	358,400,000
1906	145,000,000	377,800,000
1905	136,000,000	336,000,000
1904	140,000,000	396,000,000
1903	131,300,000	364,000,000
1902	143,300,000	350,000,000
1901	92,000,000	280,000,000
1900	141,000,000	314,200,000

Winter wheat is grown in Germany, and the quality is rather poor. It is white and soft, and requires, to make high-class flour, an admixture of such varieties as No. 1 northern or No. 2 hard winter from America or similar qualities from other countries. The ground is, of course, seeded in the autumn, while harvest is in July.

In a good season the average yield per acre is very high. In a recent year wheat averaged 27.8 bushels, rye 22.7, barley 31.3 and oats 40.6 bushels.

The high yield of wheat is due to fertilization and intelligent agriculture. Despite the application of the most advanced methods, however, Germany has some bad seasons. The crop of 1907 was a short one, falling nearly 30 per cent. below the previous crop. That of 1901 fell off 35 per cent. from the preceding year, while the following crop exceeded that of 1900.

Such great variations are due to the changeable, unfavorable winters, during which there are periods of freezing and thawing, sometimes resulting in a great amount of winter-killing.

GRAIN IMPORTS AND THE TARIFF.

During the last five years the annual imports of wheat into Germany have ranged from 70,000,000 to 90,000,000 bushels. Flour imports are very small, due to an import duty of $2.16½ a barrel. This is an increase of 61½ cents since 1905.

The total imports of grain in 1907 amounted to approximately 261,000,000 bushels; in 1906 to 310,000,000, and in 1905 to 233,000,000.

The following table shows the amount of the various grains imported for a series of years, in bushels, and the amount of flour, in sacks of 280 pounds:

	1907.	1906.	1905.	1904.
Flour	160,000	209,300	146,300	225,100
Wheat	81,195,000	91,993,000	73,922,000	74,785,000
Corn	42,530,000	43,446,000	34,942,000	31,237,600
Oats	20,194,000	63,127,000	39,442,000	19,478,400
Rye	24,692,000	27,456,000	21,064,000	21,184,000
Barley	92,961,000	84,617,000	64,131,000	68,337,600

Yet in spite of these immense importations, the duty was increased in 1906 on all grains excepting flaxseed, which is admitted free.

The following table gives the present duty on grain from countries having a reciprocal treaty with Germany, and the duty where no treaty exists—the figures represent cents per bushel:

	Treaty.	No Treaty.
Wheat	35.7	48.5
Corn	10.3	32.4
Oats	32.4	45.5
Rye	32.4	45.5

The heavy imports of 1906 were in part due to importers anticipating the going into effect of the tariff. The new tariff law cannot be repealed nor altered for twelve years from the time it went into effect. A concession is granted exporting millers, whereby they may import wheat and export the flour. They get back the amount of duty paid by means of a "drawback". As they may retain the mill-feed and sell it in Germany, where prices of feeding-stuffs are always high, the big German millers have a distinct advantage over American millers in the markets of the importing countries. The best mills of the country, and there are several large, modern

and aggressive ones, grind only a small percentage of native wheat. This wheat comes principally from Russia, America, Argentina and Roumania.

Speculative trading in grain futures is prohibited by law, which is another result of the influence of the agrarians. The markets, however, will be touched upon in a chapter on grain exchanges.

AGRICULTURAL PROGRESS.

As already said, great advancement has been made in agriculture in Germany. The progress that has been made may be traced to the same factors that, as mentioned in previous chapters, lifted agriculture to a higher level in Hungary and in France. That is, co-operation and credit banks. In addition, agricultural instruction has played an important part in all these countries, particularly in Germany.

Agricultural instruction of the present in that country is the development of a hundred years, and of late years agricultural chemistry has received the attention of some of the best minds in Germany. A report on agricultural instruction in Germany has been prepared by Dr. Rose, his majesty's consul at Stuttgart, in which the subject is treated under the following subdivisions:

Elementary—Farming schools; agricultural winter schools; special lower agricultural schools; rural improvement schools; and special courses of lectures.

Advanced—Independant agricultural high schools; agricultural institutes at the universities; and other higher agricultural institutes; special lecture courses for advanced owners, managers and farmers of large estates; and agricultural schools.

Space will not permit even a brief mention of the advantages to agriculture that have come as a result of scientific teaching.

And yet, while science could tell the farmer what crops would pay him best, and how to raise big crops—how to increase his yield, it could not tell him how to sell his grain to the best advantage nor how to borrow money when it was necessary to his advancement. But all these things were finally added unto him; and they came by co-operation, politics, and credit banks. Reference will be made to the latter only, yet the credit bank system had as its fundamental principle co-operation.

Large land-owners, of course, never experienced difficulties in borrowing money. It was the small farmers who had nothing but their personal security to offer. The conditions that brought about a situation demanding financial aid to the farmers were similar to those that obtained in France. Under these conditions, suffice it to say, it often meant failure or success whether the farmers could obtain a loan until the gathering of the next crop relieved the necessity.

The way out of the difficulty finally developed in the organization of credit or loan banks on the Raiffeisen principle.

Such a bank is "an association of neighbors uniting to borrow a sum of money, in order to lend it out as cheaply as possible in small amounts to such of themselves as may need loans."

These banks also receive savings deposits, which often form a large part or perhaps all the funds required. Usually some of the members are men of more means than the others, and they join the association to help their neighbors by increasing the credit.

In the true Raiffeisen bank the liability of each member is unlimited, but there is now a tendency to modify this feature. Yet there are no records of members having suffered from this rule.

Each society or association confines its activities to one locality, where the members are all known to one another. Any member, however poor, can obtain a loan for any purpose approved by the loan committee. Each borrower must specify the purpose for which he wants a loan. This is also true of the credit banks of Hungary, and is in itself a safeguard.

The first Raiffeisen bank was founded in 1849 by a man of that name; the second in 1854; the third in 1862; and not until 1880 did they really begin to spread. This was about the beginning of agricultural progress or "new agriculture" in both Germany and France.

There is now a central bank at Neuwied, and affiliated with it there are 4,000 throughout the country. There are other co-operative banks also, 4,450 all told, in Prussia, and 3,900 in other German states. The total membership of the societies is 1,500,000.

CHAPTER XVI.

HOLLAND.

Importer and Distributer—A Free Trade Country—Large Flour Imports—Port of Rotterdam—Amsterdam—Cargoes Distributed by Water—Inland Waterway Development.

As Holland differs from every other country in other ways,—in topography, canals and dikes, tulip fields and flower gardens on a huge commercial scale, and is, moreover, a diminutive country with large commercial cities,—it also stands unique in the grain trade. Raising but five to six million bushels of wheat, it imports 70 to 80 million, of which it retains only some 16 million (wheat and flour) for its own use. By far the most of Holland's imports are distributed throughout Germany. This little country with its great port, Rotterdam, therefore occupies the peculiar and important position of importer and distributer—it stands between the wheat-growing countries and the consuming. Belgium, on a smaller scale, is also a distributer, but Holland even buys some of Antwerp's importations.

The gross imports of wheat and flour in Holland for the last five seasons (from September 1st to August 31st) were as follows:

	Bushels.	Barrels.	Total Bus.
1907	73,770,000	1,960,000	81,590,000
1906	75,840,000	2,290,000	86,145,000
1905	68,925,000	1,715,000	76,642,000
1904	69,440,000	1,940,000	78,170,000
1903	63,369,000	1,961,000	72,193,000

The average per capita consumption of Holland is estimated at four bushels, and the population is 5,350,000. This calls for less than 21,400,000 bushels, and as the

native crop is five to six million, the imports in the foregoing table indicate that from 53 to 66 million bushels was exported each season.

Holland is a free trade country; the only one in Europe besides Great Britain that admits both wheat and flour free of duty, although Belgium has no duty on wheat. Holland is therefore the only country on the continent in which American flour finds a market in an important quantity. The bread of the cities of Holland is principally made from American flour.

The imports of flour into European countries are of interest in this connection, as showing the effect of the duty, while wheat is admitted free in Belgium (and at a lower duty than flour in others). In a recent year Belgium imported but 29,000 barrels of flour. In the same year Germany imported 160,000 barrels of flour and 74,000,000 bushels of wheat. France imported 200,000 barrels of flour and 38,000,000 bushels of wheat. Italy imported 7,800 barrels of flour and 30,000,000 bushels of wheat. Yet the little free trade country of Holland imported 1,340,000 barrels of flour, or more than all other European countries combined, including Denmark and the other northwestern countries, excepting only free trade Great Britain. Thus are the milling interests of European countries protected.

It is probably not necessary to say that the Dutch millers have not prospered. Yet there are enough commercial millers in Holland to maintain an association. They have at times endeavored to have an import duty placed on flour, but as yet have not succeeded. British millers have also made the same attempt, but with the same lack of success.

It appears that in all countries the tendency is

toward relatively low duties on the raw material and high duties on the manufactured product. This carried out generally in wheat and flour (which does not seem impossible), the result would be to reduce the milling capacity of all countries to home requirements.

The countries supplying Holland with wheat are, first in quantity, Russia; Belgium, largely Argentine wheat, second; the United States, Roumania and other countries.

Wheat from Argentina begins to arrive freely in March, while Russian and American winter wheat arrives in good volume in August. Spring wheat from Russia and America comes along in September. The months mentioned are the time the new-crop wheat begins to arrive freely; for of course the movement continues throughout the year.

Although Amsterdam is the chief commercial center of Holland, and one of the important cities of Europe, Rotterdam is the principal port. Many cargoes intended for Amsterdam are unloaded on barges at Rotterdam and brought over via canal. Amsterdam, by means of locks, has shut out the ocean. Vessels cannot come to the docks without passing through the locks.

From both Rotterdam and Amsterdam, flour and grain are distributed by barge on the canals throughout the cities and the country. Grain is sent inland hundreds of miles by water. Most of the large importing houses are at Amsterdam, but they have branches at Rotterdam.

Like all important European cities, Amsterdam has a bourse. The building is owned by the city, and anyone may trade there on payment of a small annual fee. The bourse is divided into several departments or ex-

changes for the various branches of trade. The Stock Exchange occupies one, the Grain Exchange another.

In grain there is no future market, and so, of course, no speculative market such as in the grain exchanges of America.

As cargoes of grain at Amsterdam are either distributed as soon as unloaded or are stored in barges or lighters, elevators are not much required here. However, there is one of fair size, 700,000 bushels capacity. It is of brick, with brick bins or silos, and corresponds to an American terminal working-house. Unlike an American terminal elevator, however, storage room is given to flour and linseed cake. The elevator is owned and operated by an incorporated company.

The location of Rotterdam at the mouth of the Rhine gives it great advantages as a point for breaking up cargoes and distributing them inland. Added to the natural advantages of the Rhine and its tributaries, the canals make it possible to deliver loads of grain at many small mills away inland at a cost far below that of railroad transportation, and with much greater convenience to the millers.

Inland navigation of the canals and rivers of Holland, Belgium and Germany has developed into an industry of an importance that can be little realized in America. Steamboats are on all the rivers, and at Rotterdam and Amsterdam one sees hundreds of barges, continually coming and going with their loads of merchandise of various kinds. They are propelled by pole, and sail, or they may be drawn when in the narrow canals by a man on the bank. The flat country permits the use of sails to almost as great advantage as on the open water; and the traveler sees boats apparently sail-

ing unobstructedly through the meadows and fields of Holland, for the water cannot be seen at a distance.

Of course, the barges vary greatly in size. Those in the grain traffic carry from 12,000 to 25,000 bushels of wheat.

The Netherlands and Germany have developed a race of inland sailors, for the life on the rivers and canals is just as distinct from other occupations as one trade in the cities differs from another, or farming differs from them all. Families live on the canals and rivers; babies are born on the boats, grow up and spend their lives on them. Women are seen on most of the barges and they take their turn at steering or helping with the sails.

One feature of the steamboat navigation on the Elbe, from some distance above Hamburg to away inland to the boundary of Bohemia, cannot fail to impress the American traveler. Now the Elbe is a swift stream and boats are not easily propelled against the current. To overcome this, where speed is not important and where economy of fuel is a great consideration, a chain has been laid on the bottom of the river. This chain is wound around an iron drum in the boats that use it, and the drum is revolved by means of the boat's own engine. The chain unwinds and trails behind, underneath, as the boat goes upstream like a man drawing himself forward, hand-over-hand.

Furthermore, where the river is shallow and the banks soft and likely to shift or wash away, the channel is narrowed and an artificial bed and banks made by means of stones laid on edge like bricks in a pavement.

Some day the rivers of the United States will be

"improved", but we do not yet know what the term means. With few exceptions our natural waterways are as virgin as were the prairies of the West when the buffalo roamed over them.

CHAPTER XVII.

BELGIUM.

Importance as an Importer—No Duty on Wheat—Exporter of Grain—Antwerp the Third Port of the World—Big Grain Importing Houses—Grain Handling.

BELGIUM has the distinction of having the greatest wheat-importing port in Europe, Antwerp; though in the amount of all grain it is exceeded by London and Liverpool. Practically all the wheat imported into Belgium comes to Antwerp. The country also has the distinction of being the greatest wheat-consumer per capita in the world. It is estimated that the average consumption is eight bushels, and as the population is 6,900,000, the annual bread requirements of this little country are approximately 55 million bushels.

The native crop is from 12 to 14 million bushels, and the average net imports are about 43 million. This is higher than they were for the five-year period preceeding 1904. There is no duty on wheat into Belgium.

The gross imports of wheat from 1903 to 1907 inclusive were as follows, in bushels:

1907	67,370,000
1906	71,950,000
1905	62,250,000
1904	63,700,000
1903	57,660,000

Exports of wheat and flour (for a little flour is both exported and imported) during the years noted in the

foregoing table were from 11 to 30 million bushels a year. The exports go to Holland, Germany and France.

Belgium draws its supplies from the Danube, the United States and Argentina. Its importers have little traffic with Russia. New wheat from the Danube begins to arrive freely in Antwerp in September, while Argentine wheat reaches the port in March.

Antwerp, the greatest of the continental grain markets, owes its importance to two things, its location and the state railroads. It is not a natural market place, made so by the proximity of grain fields and mills, neither is it an elevator center, where supplies are stored. It is a great central point of the continent to which cargoes from nearly all the grain-exporting countries of the world come to unload. From the Balkan states, Argentina, America and Canada, ships of grain are continually headed toward Antwerp, and finally meet in this port. Then the cargoes are redistributed, spreading out again, going by barge through the great canal system, or by train, to Holland on the north, throughout Belgium, into Germany and northern France. Antwerp keeps but little of what it receives. It is, first, an international market; and second, an international distributing place.

As the third port in the world in volume of general business, and headquarters for forty steamship lines, Antwerp has, of course, had some inducements to offer exporters in other countries. Besides transportation facilities by water and rail, which have developed with the port, and besides being a desirable distributing point for western Europe, the railroads, owned and operated by the Government, have made rates inland which induced business to come to Antwerp, even much that would by preference have gone to Hamburg.

While there are many grain houses in Antwerp, probably a dozen names cover the number that may be called the principal importers.

These large houses have branches in the exporting countries for buying, and branches for selling in the importing countries. Likewise, some Argentine houses, or exporters in the Balkan states, have agents in Antwerp, while the mills of Germany and northern France have their buyers here.

A large part of the grain business of Antwerp is done on London contracts.

Cargoes of grain are usually sold before they arrive, and they are divided among many buyers. An importer buys a cargo say at Buenos Aires or the Black Sea. As it requires about four weeks for it to arrive, he has that length of time in which to dispose of it. It is desirable to sell it before arrival to save charges, for there are no elevators at Antwerp, though there are two large warehouses.

When a cargo of grain arrives at Antwerp, it is immediately unloaded for distribution, and no more perfect facilities for distributing imports of any kind can be imagined. Yet the actual unloading of grain is not done by the quickest and most modern methods. The steamers are brought alongside the docks and are unloaded directly onto cars, if desired, or to barges on the other side of the steamer, if the grain is to go by canal. The large Rhine barges hold 25,000 bushels of wheat. Thus the grain finds its way throughout western Europe, often through the devious canal systems to within a few miles of its destination, where it is finally—the short haul—brought by rail.

While the grain must be unloaded as soon as the

vessel arrives in port, it is not necessarily shipped inland at once. It may be, and often is, stored in barges, which are chartered by the importer when he has not sold the grain previous to arrival. He is therefore not compelled to sacrifice the grain if the market is not satisfactory.

The Antwerp market will be mentioned in a chapter on grain exchanges.

CHAPTER XVIII.

UNITED KINGDOM.

Imports 200,000,000 Bushels Annually—Effect of World's Crop Shortage—Imports Since 1898—Wheat Increasing, Flour Decreasing—America the Greatest Source of Supply—American Flour—Milling in Great Britain—Millers Aggressive — Milling Centers — Agriculture — Decrease of Wheat Area, Increase of Grass Lands—Acreage—Wheat Crop.

THE United Kingdom, importer of over 200,000,000 bushels of wheat annually! What a gigantic task to supply this little kingdom with its daily bread! It is difficult to comprehend what the gathering together here in a few market places of over 200,000,000 bushels of wheat every year means; the buying and bringing it from North America, South America, Australia, Russia and India; the army of people employed in raising it, the thousands of cars to haul it, the vessels to float it in, and the millions of money to finance it. It is a stupendous traffic of itself, the feeding of the British people with their bread only. But further, it is as difficult to realize the vast extent of fields required to grow such a quantity of wheat. If, during the last five years, every bushel from the wheat fields of Minnesota, the Dakotas and Kansas, after reserving only enough for bread and seed in those states, had been shipped direct to the United Kingdom, it would not quite have supplied the requirements. A few million bushels additional would have been drawn from other sources.

It is not surprising that when there is a crop shortage in the great wheat-growing countries, the importers

of the United Kingdom should be apprehensive lest they could not get sufficient supplies. Such a situation existed during the latter half of 1907; and even at the beginning of 1908 the statisticians of Liverpool and London could not say with certainty that the people of the United Kingdom would have quite enough bread until another crop should be harvested in America, Russia and the Danube country.

The combined imports of wheat and flour were the heaviest from 1903 to 1907 they have ever been, while the heaviest flour imports were from 1892 to 1904. The year for which estimates are made corresponds with the American spring wheat "crop year" or "milling year". That is, from September 1st to August 31st.

The table which follows gives, for a series of years, the amount of wheat in bushels and of flour in barrels together with the total computed in bushels, imported into the United Kingdom. The native production of wheat is also shown, in bushels.

Imports of wheat and flour into the United Kingdom, also the native wheat production. Amounts for 1899 to 1903 are official; the others are unofficial (000 omitted):

	U. K. Crop. Bus.	Imp'd. Wht., bu.	Imp'd. Flour, bbl.	Imp'd. Total, bu.
1906-7	56,000	178,300	7,580	211,150
1905-6	62,000	176,500	8,150	201,800
1904-5	62,000	194,200	6,360	221,700
1903-4	40,000	173,150	11,150	221,400
1902-3	48,800	164,500	11,780	215,500
1901-2	56,400	151,200	11,100	199,300
1900-1	53,600	129,100	12,900	185,000
1898-9	67,200	124,375	13,125	181,250

It takes but a glance at the foregoing table to see the trend of the wheat traffic. The native crop, hardly more than half what it was thirty years ago, seems to be

fairly well established at the present average production. The total breadstuff imports show an increasing tendency, though smaller world's crops may curtail them for two or three years. The increase in wheat and the decrease in flour imports tells its own story; and that is, the rise of the British milling industry.

Ninety per cent. of the wheat supplies of the United Kingdom come from the United States, Canada, southern Russia, Argentina, India and Australia. The table which follows shows the source of supply of approximately 90 per cent. of the imports for one year recently. Yet it happened that Australia had a crop failure that year while India had a good crop.

Countries from which the United Kingdom drew most of its wheat and flour during the calendar year of 1903, showing the amounts from each:

U. S., Atlantic coast	77,600,000
U. S., Pacific coast	10,700,000
Canada	27,200,000
Southern Russia	30,400,000
Argentina	29,000,000
India	31,600,000
Total these countries	206,500,000
Total all countries	222,100,000

New winter wheat from the United States and Russia begins to arrive freely in British ports in August. Spring wheat from Russia arrives in September; from the United States in October, and from Canada in November.

Oregon and Washington wheat begins to arrive in February; Argentine in March, Australian in April, and Indian from the port of Kurrachee in July.

London and Liverpool are the greatest grain importing ports in the world, and there is little difference between them. Some years Liverpool leads London in the total amount of direct imports from foreign countries of all grain. Hull is third, with about half the volume of direct imports of all grain that London or Liverpool receive. The other large grain importing ports are as follows, in the order of their importance: Bristol, Glasgow, Leith, Belfast and Manchester.

Mention of the two great markets, Liverpool and London, will be reserved for a chapter under grain exchanges.

The United Kingdom will always take wheat from the United States when it can get it. But whether it can get it concerns the British importers and not the American farmers. When they cannot buy American wheat it means that the price is too high for them.

American flour, however, is another matter; and the declining imports into the United Kingdom are not reassuring to the millers of the United States.

Flour imports reached their maximum in the year from September 1st, 1898, to August 31st, 1899. The United Kingdom in that year imported 13,125,000 barrels, principally flour from the United States. These are official figures. During the period from 1887 to the summer of 1904 the American millers fairly controlled the markets of the United Kingdom. During the early years of that period the imports of flour were approximately as heavy as in 1905, '06 and '07, but the wheat imports were much less twenty years ago. Flour imports had a phenominal rise; and they marked an epoch in American milling; their decline marked the advance of British milling.

While the volume of the flour imported into the United Kingdom is still considerable, more of it is from Canada than was the case five years ago. Furthermore, the export business from the United States is on a different basis than when the trade was developing. Then there was profit in the export business, whereas now few mills expect to make a profit in it. By exporting their surplus, they can run steadier and so reduce the cost of production; and by so doing they can compete in American markets with one another a little more energetically.

During some twenty years of mill development in America and the upbuilding of the export trade, the milling business languished in the British Isles. In 1880 there were 10,000 mills in the United Kingdom, including windmills. The millers were slow to discard their old methods, particularly the buhrs; but by 1890 there were few flour mills that had not discarded the stones for the rolls. Those that had not, were changed into meal and feed mills.

From 1881 to 1891 the number of master flour millers decreased from 10,000 to 2,000. A factor in the wiping out of the small mills was the decreasing acreage of wheat from year to year.

Although the larger mills were changed over to the roller process and new mills were built, and while British millers had the same opportunities to buy modern machinery that Americans had, there seemed something lacking in their methods. They were not regarded as serious competitors of American millers in the markets of the United Kingdom.

When the change was being made to the modern methods of milling, the millers realized that there was a distinct advantage in being at the ports. Accordingly,

many of the inland mills were abandoned, and the new and large mills were erected at the important seaports. Some improvements were continually going on, but nothing of great importance until after 1902.

In that year a tax was placed on wheat and flour imported, and the millers succeeded in having the tax on flour made relatively greater than on wheat.

The awakening of the milling business really dates from this incident. While the discriminating tax did not diminish the imports of American flour, it did reduce the profits on the business. Moreover, it seemed to put life and energy into the British millers, as it demonstrated to them that united action on their part might do what time and chance had failed to do for them.

The millers now began an aggressive campaign in the large markets of the United Kingdom. They were not only aggressive, but they made better flour than ever before. It was as if they had been at school for years and had just graduated. It slowly dawned upon American millers that at last they had competitors who were really to be feared, or at least respected.

The British millers have, in the last few years, become very expert in blending their several kinds of wheat. They have the world to draw upon and to select from.

A miller may at one time grind one part American spring wheat, two parts Russian and three of English. Or he may have a blend consisting of 60 per cent. Indian, part English and part Argentine. Or, again, 10 per cent. Indian, 40 of Argentine and the remainder something else.

A moderate crop of wheat in America in 1903, followed by decreased exports of flour, taken in connection with large crops in Argentina, India, Russia—in fact,

in every other wheat-growing country—these favorable conditions started a veritable mill-building boom in the United Kingdom. Then came the short crop of 1904 in America; and the British millers enjoyed prosperity probably never dreamed of. Some of the large milling companies made fortunes in one year.

Some twenty new mills were erected and many others enlarged during the boom; and the capacity was increased equal to over 4,000,000 barrels a year.

The milling centers are Liverpool, Bristol, Hull, London, Cardiff and Newcastle.

It is estimated that the milling capacity of the United Kingdom is greater than the requirements. The mills of the United Kingdom make approximately 50,000,000 barrels of flour annually.

The early part of 1906 witnessed a setback in the prosperity of the mills. Overproduction, the cutting of prices in the London market and the delayed arrivals of numerous shipments from America, purchased in the fall —these together with the declining prices caused great depression and some heavy losses. These, however, are but temporary conditions.

Agriculture has some problems to solve in the British Isles, as well as milling. And it may be assumed that after many years of struggling against adverse conditions and taking advantage of favorable ones, shifting about of crops and the adoption of improved and scientific methods —it may reasonably be assumed that agriculture is established on a substantial basis; that the transition stage has been passed.

In traveling over England and southern Scotland one is impressed with the area of land in grass, and it is very noticeable that much of this grass land has at some time

been under cultivation. Its uneven surface shows the old furrows. Of the total area of cultivated and of grass lands in the United Kingdom, considerably more than one-half is permanently in grass—hay or pasture.

The total area under cultivation and in grass was, in 1902, 47,752,000 acres; and as the wheat acreage was approximately the same in 1907 as then, it is probable that this total has not materially changed.

Of this total area, 28,408,000 acres is permanently in pasture or hay, while 6,108,000 is in grasses or is rotated with other crops. The area in grain—wheat, oats, barley, rye, beans and peas—is 8,517,000 acres, while 4,241,000 acres is in green crops and 478,000 acres either fallow or in small fruit.

The wheat acreage in 1903, was 1,621,000, official figures, and this is approximately the area unofficially esimated in 1907.

The wheat acreage shows some interesting changes, as does also the production and yield per acre. The table which follows shows the acreage and production for three seasons when wheat growing was at its height:

Crop year.	Acreage.	Crop, bus.
1852-3	4,058,000	92,600,000
1856-7	4,213,000	138,500,000
1863-4	3,698,000	143,300,000

The crop harvested in 1864 gave the enormous average yield per acre of 38¾ bushels, if the acreage and crop were correctly estimated. This is far above the present average, which makes it seem probable that 1863-'64 was a "freak" season.

As late as 1870 the United Kingdom raised 112,800,000 bushels of wheat; but from that year to 1900 the

acreage had a decreasing tendency. It now seems to have established a basis around 1,620,000 to 1,775,000 acres, on which a crop of 55,000,000 to 60,000,000 is raised.

The yield per acre of wheat in the United Kingdom is 30 to 33 bushels.

There is a partial crop failure about every six or eight years, owing to cold and wet. In 1879 there was a total failure. The grain never matured. It frequently happens that a considerable percentage of the crop is wet and unfit for milling.

The high average yield per acre is largely due to fertilization. Some experiments extending over a period of fifty-one years showed an average of 32.9 and 32.1 bushels an acre respectively for two plots of ground, for the fifty-one years. These plots were well fertilized. One plot on which wheat was raised every year for forty years without any kind of fertilization, averaged 12.5 bushels per acre.

The consumption of wheat per capita is estimated at 5.8 bushels, and of rye six pounds.

CHAPTER XIX.

ARGENTINA.

Importance Among the Wheat-Growing Countries—Value of Geographical Position—Steady Increase of Exports—Crop and Exports Since 1897—The Wheat Lands—The Soil—Wheat-Growing Provinces—The Trend—Seasons—Climate—The People That Raise the Wheat—Immigrants in 1906—Number and Size of Farms—Seeding-Time and Harvest.

THE only rivals that the United States and Russia will ever have to contest their right to be called the two greatest wheat-growing countries, are Argentina and Canada; and the development of these has only just begun. But while Argentina and Canada each has sufficient area suitable for wheat growing to make them the greatest wheat countries in the world, Argentina has handicaps in its soil and immigrants that will doubtless check its advancement and probably leave it permanently in fourth place. Canada, on the other hand is blessed with soil only equaled in some of the wheat states of the United States and in the Black Soil belt of Russia, and rapidly being settled by intelligent and progressive people who will remain there permanently. With these advantages and an unlimited area adapted to wheat, it will probably become the first producer in the world, and the greatest source of supply for the United Kingdom.

In great area and small population; in being only partially developed, and in exporting a very large percentage of the crop raised, Argentina and Canada are alike. Their importance in the estimation of the importing countries depends upon the amount they export and

not on the size of the crop. There is also a sentimental importance due to the undeveloped possibilities ahead of them.

Argentina possesses an additional importance, however, in its geographical position. With harvest in December, export shipments beginning the last of January or the first of February, and new wheat arriving in London, Liverpool and Antwerp in March, the crop fits in between two crop seasons in northern latitudes as though especially designed by Nature for the advantage of the importing countries.

The crop harvested in December, 1907, for example, seemed almost like a special gift from the gods; for after a season of short crops in every exporting country and therefore an actual scarcity of supplies, Argentina harvested the biggest crop in its history. The eyes of the world were on the crop from seeding-time to harvest; for a failure would have meant famine prices for wheat everywhere and an actual scarcity of bread in the United Kingdom and Germany.

The geographical position of Argentina is therefore of the first importance; yet the country is even now a good third among the great wheat exporters, and in 1908 the shipments will exceed some of the recent small years of the United States and Russia. But all its shipments do not go to Europe.

The rise of Argentina has been rapid and very steady. In 1902 the exports were small, due to a short crop harvested in December of 1901. Since that time there has not been a failure, and in each succeeding year, with one exception, the exports were greater than in the preceeding season. This is a remarkable record for such a country; but after this succession of big crops, a failure

or a series of poor years is, by the law of averages, almost certain.

Argentine statistics of crop yields and of export shipments are at times conflicting, and one feels safer to regard figures from that country as approximations rather than as being accurate. In the table which follows, the crop and export figures from 1897 to 1904 inclusive are from the reports of the Argentine department of agriculture, with the exception of the exports in 1902. All the other figures are from the commercial estimates that are accepted in the United States.

Wheat production in, and exports from, Argentina, for eleven years, amounts in bushels:

Harvested December.	Bushels.	Exported During	Bushels.
1907	200,000,000	1908	*155,000,000
1906	156,000,000	1907	103,000,000
1905	138,000,000	1906	86,600,000
1904	145,000,000	1905	96,000,000
1903	129,000,000	1904	89,000,000
1902	101,000,000	1903	63,000,000
1901	57,000,000	1902	23,700,000
1900	74,700,000	1901	33,200,000
1899	99,075,000	1900	70,900,000
1898	88,060,000	1899	62,900,000
1897	49,400,000	1898	23,700,000

* Estimated.

The crop of 1900 was probably overestimated, else the exports in 1901 would have been greater than 33,200,000.

There are two phases of the production question to be considered, namely, the immediate future, or say from 1908 to 1913, and the future when the country shall have established itself on a permanent basis.

As for the immediate future, it is probable that the country will experience what is so forcefully expressed in America by the term "a boom". This will be brought about by the period of prosperity, due to successive years

of good crops, culminating (if it has culminated) in the record crop of 1907-08 and the phenominal prices received for it. It is probable that the country will see an influx of settlers and such a development of wheat lands as no country has ever witnessed excepting Western Canada from 1903 to 1907. Yet it is probable, despite any increased acreage, that the total production and the exports have for the present reached their maximum, due to that inevitable and mysterious law of averages.

The wheat lands of Argentina are level and the altitude is scarcely greater than the sea level. The regions where wheat is now, or may be, raised, is described by a writer of the Argentine Department of Agriculture as follows:

"Three-fourths of the arable land is formed of vast plains, crossed by low hills, of alluvial deposits of recent volcanic and granitic origin, composed of fine, light, silicious soils, free from stones, and generally permeable. It is of a depth varying from 10 to 50 inches, and nearly always contains considerable vegetable earth.

"The land in the east, north, center, and also in the western and part of the southern part of the province of Buenos Aires and in the southern part of Cordoba and Sante Fe, has a light, pumiceous soil. In the southeastern and southern parts of the province of Buenos Aires the soil is lighter and more sandy. Toward the west stretch the extensive plains of the Pampa, formed of a light, sandy, humiferous soil. It becames more fertile in Mendoza and San Juan, where it is deep and often mixed with pebbles, and rests on a subsoil of shingle. The province of San Luis is similarly formed, but in general the soil is not so deep and is less humiferous than in the Pampa. The soil in the southern part

of Santa Fe and the center of Cordoba is sandy, somewhat dry, and wooded. In Entre Rios the soil is sandy, somewhat clayey, often light and rich.

"In the territories of Rio Negro, Neuquen, Chubut, Santa Cruz, and Tierra del Fuego the soil has the same physical features as in the Pampa and is generally light and sandy, with the exception of the bottom of the valleys, where clayey, humiferous soil of great richness is always found."

It is particularly worthy of note that the soil is generally light and somewhat sandy; and in considering the permanent future of Argentina as a wheat-growing country this must be taken into account. As compared with the Black Soil belt of Russia, all the advantage seems to lie with the latter when careless and ignorant methods of agriculture prevail. What the lands of Argentina will produce after a few years of abuse will be a matter of importance when the new lands have been scratched over.

Until within a very few years wheat growing was confined to the provinces of Buenos Aires, Entre Rios, Santa Fe and Cordoba; and by far the greater part of the wheat lands are still within these provinces. The trend of wheat growing up to about 1900 was toward the north, which in Argentina is toward the equator. Therefore the settlers were working into a hotter climate and one not so well suited to wheat as the colder latitudes farther south. The farmers found the limit of the successful wheat growing toward the north, and many of them abandoned their lands and moved farther south. The present northern boundary of the successful wheat area is in about the same latitude as northern Oklahoma. The present wheat lands extend south to

about 40 degrees, although it is asserted that wheat can be successfully grown as far south as 53 degrees. This is approximately the same latitude south that Prince Albert and Edmonton, in Canada, are north. The present and the possible wheat area in Argentina therefore extends north and south and lies between parallels corresponding to those of northern Oklahoma and Prince Albert, in Saskatchewan; only the north end is hot and the south end cold.

Since about 1901 the trend of wheat growing has been to the south and southwest of what was previously deemed the real wheat country. It now seems to have been clearly demonstrated that the permanent wheat area will be in the extreme southern part of Santa Fe and Entre Rios, the southern half of Cordoba, practically the whole of Buenos Aires excepting near the coast, and in the territories to the southwest of the province of Buenos Aires. The present western limit of wheat growing extends some 400 miles west of the city of Buenos Aires. To the southwest it is limited to the extent of railroad development. It is following the railroads as fast as they are built. The settlers go back from the railroad as far as thirty miles, although that distance makes an unprofitably long haul when wheat is being marketed.

The estimated acreage in wheat in the different provinces in 1907 and 1905 is shown in the following table:

	Acres, 1907.	Acres, 1905.
Buenos Aires...	5,780,000	5,733,000
Santa Fe	3,360,000	3,500,000
Cordoba	3,535,000	2,957,000
Entre Rios	724,000	731,000
Others	926,000	400,000
Total.....	14,325,000	13,321,000

Seasons in Argentina are, of course, the reverse of those in North America and Europe. The summer months are December, January and February; the fall, March, April and May; winter, June, July and August; and spring, September, October and November.

The climate, except in the southern territories, is mild during the winter and very hot in the summer. The land can be worked early or late without regard to winter weather, though rains may interfere. The climate does not make it necessary for the farmer to provide dry feed for the winter for horses and cattle; though an occasional cold and dry winter may cause the pastures to give out.

There is a wet and a dry season. The wet season begins in October and continues until March, while the dry season is from April to September. In the southern territories the climate differs from that of the present great wheat country, and the rainfall is more evenly distributed throughout the year.

There are, naturally, some adverse climatic conditions; as, for example, too much rain, or, in the southern part of the wheat country, too little. A wet summer followed by a mild winter develops an exceedingly prolific growth of weeds, which choke out the wheat enough to materially reduce the yield. Then, too, hot winds from the north in November and December sometimes cause great damage just as hot winds in Kansas or Minnesota may.

Soil and climate constitute but one of the factors necessary to make a great wheat-producing country. These Argentina has; but there are two other factors just as necessary, and they are, people and transportation facilities. The development of the latter gives considerable promise, but the people who raise the greater part of the

grain are a handicap to the advancement of the agricultural interests.

Probably 75 per cent. of the wheat of the country is grown by those who depend on family labor; and, generally speaking, only a third of the farmers own the land they cultivate. There is, therefore, a "lack of permanent interest" in the soil; and this means the rapid exhaustion of the land.

It is estimated that 95 per cent. of the small farmers begin by renting land on shares—sharing the crop with the owner of the land. Such men have little experience, some have none at all, and very little money. The farmer and his family do the work on the land, while the owner of the land sells the crop. This system is, of course, not much better than slavery for the farmer, and he advances to the cash-rent system as soon as possible.

By far the greater part of the wheat growers are Italians of a low order of intelligence. The one great aim of many is to get enough money to enable them to return to Italy and buy a little land or go into some small business. They have not intelligence enough to understand or to learn that the land would yield better with better plowing and good seed. After a failure or two many of them abandon their rented land and move on to another locality. They are continually in debt to the country merchant.

These ignorant Italian farmers are like the Russian peasants in having a great "land hunger", but with the difference that they can satisfy the craving. It is estimated that the average small farmer has 247 acres, and some of them more. Some even try to cultivate 400 acres or more with only the labor of their family. This, of course, results in not half cultivating any of it. Dur-

ing the season of seeding and harvest the whole family works in the fields from daylight to dark. As a rule they live in miserable huts, and their habits of life are of a very low order, and the promise of improvement is not cheering for Argentine agriculture.

An astonishingly large number of Italians return to their native country every year, and many of the immigrants stay in Argentina only during harvest.

In 1906 there were 253,536 immigrants admitted into Argentina. Of this number 127,578 were Italians; and the other nationalities were, Spaniards, 79,287; Russians, 17,424; Syrians, 7,177; Austrians, 4,277; French, 3,698; Germans, 2,178; British, 1,690; Montenegrians, 1,081; Greeks, 945; Portuguese, 885; Brazilians, 608; Swiss, 503, and others in small numbers. The immigration department reported that it had no difficulty in placing the immigrants in the various provinces.

The population of the country is about 5,000,000. Of this number, 1,000,000 are in the city of Buenos Aires, the national capital, and 2,000,000 in the Province of Buenos Aires and the three neighboring provinces. The other ten provinces are very thinly populated.

An estimate was made in 1901 of the number and size of the farms in the four principal provinces, and the total number was placed at 34,067. They were classified according to size as follows:

Size of Farms.	No of Farms.
124 acres or less	13,786
125 to 247 acres	8,690
248 to 494 acres	8,642
495 to 741 acres	2,091
742 to 988 acres	479
989 to 1,235 acres	187

1,236 to 1,483 acres	90
1,484 to 1,730 acres	37
1,731 to 1,977 acres	17
1,978 to 2,224 acres	15
2,225 to 2,471 acres	5
Over 2,471 acres	28

On the big farms, on which perhaps 25 per cent. of the wheat is raised, conditions are quite different from on the land of the poor farmers. Many of the big farms are owned by Englishmen, and a few by Americans. Hired help is, of course, employed. Better seed is used than by the Italians, the soil is carefully cultivated, heavier yields are secured, and the grain is properly taken care of after harvest. Furthermore, the land is not being impoverished to the extent it is under the ignorant methods of the Italians. Some of the big stock-raisers have, during the last five or six years, turned their attention to wheat growing.

Seeding begins late in the fall, in May in the northern part of Argentina, and continues until the middle of August in the south. June and July are really the seeding months.

While harvest begins about the middle of November and lasts until the middle of January, 80 per cent. of the crop is harvested in December.

CHAPTER XX.

ARGENTINA (Concluded).

Varieties of Wheat—Harvesting, Threshing and Marketing—At the Railway Stations—The Ports—Facilities for Handling Grain—Weekly Shipments Early in 1908—Railroads—Steamship Lines—Ship Subsidy—Weights and Measures.

WHILE there are several varieties of wheat grown in Argentina, the principal one is called Barletta. This originated in Italy and it somewhat resembles the Turkey red or hard winter wheat of Kansas. It is a little softer than the latter, and is not regarded as quite so good by the millers of Germany and England. Some varieties of Russian, Hungarian, and French wheat are also grown, but the important export wheat is the Barletta. Enough durum or macaroni wheat is raised to supply the requirements of the semolina mills. Practically all this variety raised is consumed within the country.

As might be expected, all the operations from harvesting and threshing to the loading of the grain on board ship, are rather crude as compared with methods in America and Canada. Yet great progress has been made by some of the railroad companies both in cars and port facilities; and there are some modern storage elevators at Buenos Aires and Bahia Blanca.

It was estimated in 1903 by Frank W. Bicknell, special agent of the United States Department of Agriculture, that 80 per cent. of the crop is harvested with binders and stacked, much as is done in the United States. But the stacking is often poorly done, Mr. Bicknell says; and the difficulty of getting stackers at the right time

may result in great damage to the grain. If the farmer with the aid of his family tries to do the stacking, loss results from his inability to do the work fast enough.

In Santa Fe considerable of the wheat is cut with headers, and as the stacking is poorly done, the wheat is greatly damaged by rain.

There is always loss due to the inability of the farmers to get sufficient help during harvest. Threshing begins shortly after the wheat is stacked and continues until the latter part of March.

All the grain is marketed in bags, and it is hauled to the railway station in immense two or four-wheeled carts or wagons. To quote again from Mr. Bicknell:

"One little horse or mule is fastened between a pair of huge thills and a dozen or fifteen others are hooked on in various ways, with ropes tied to the axle, to the thills, to the frame of the cart, or any place to which a rope can be made fast. Sometimes the cart gets out of balance and lifts the little horse up in the air. Many cartmen use oxen, from eight to sixteen bullocks to a cart, fastened with ropes leading from a yoke tied fast to the horns; so the draft is on the animals' necks. This is the system in use everywhere in Argentina for working oxen. Often the driver sits on the yoke between the heads of two oxen. The four-wheeled carts have front wheels about half the diameter of the rear wheels, which are usually not quite so high as the two-wheelers, and carry heavier loads, requiring more horses or oxen. These great carts carry from four to six tons, and I have heard of occasional much larger loads. The men carry the bags up into them on ladders."

At the railway stations no conveniences are provided for unloading the wagons or loading the grain on cars.

Seldom can the grain be loaded directly into the cars from the carts or wagons. Until recently few warehouses were available for the small farmer; and if they were provided, the Italians will not pay the charge demanded for storing their grain. They will pile it outdoors, where, of course, it is exposed to the weather. Grain buyers will often cover the piles of sacks with canvas, but even they do not always do so.

The condition at railway stations is steadily improving, however, for now the railroad companies are compelled to provide free storage for all grain for shipment.

The bags of wheat are stacked in great piles at the railway stations. The buyers usually sort or classify the grain, by testing each bag, before shipping to the seaports. Often grain lies at the stations for several weeks before it can be shipped.

During the last five years the principal railroads have been getting large cars, after the American fashion, but the small English cars outnumber the large ones.

Almost all the grain exports are from Buenos Aires, Rosario and Bahia Blanca. The latter is the southermost port and is the natural outlet for a rapidly developing wheat area. It is better equipped for grain shipping than the other ports, though both here and at Buenos Aires there are fine docks and modern machinery. Rosario is well inland on the Parana river, but has a sufficient depth of water for large vessels.

Facilities for loading grain have been greatly improved since 1903 and large elevators built at the ports. The port at Bahia Blanca is controlled by a railroad company, which has built elevators and made many improvements to facilitate grain handling. The same company also built elevators and made extensive dock improve-

ments at Buenos Aires. Another railroad has a large elevator here, and a Belgian company also has built one.

The weekly shipments of wheat from Argentina during the first of the crop movement in 1908 were a great surprise to the trade both in America and Europe, although it was known that a record crop had been harvested. Exports began early, and for the week ending on January 18th they amounted to 2,160,000 bushels; on the 25th, 3,350,000; February 1st, 5,408,000; the 8th, 5,720,000; the 15th 7,512,000; the 22nd, 6,616,000; the 29th, 5,888,000; March 7th, 6,300,000; and for the week ending on March 14th, 7,175,000 bushels.

While, of course, there was an unusual number of vessels at the Argentine ports to move such enormous quantities of wheat, the heavy shipments also tell a story of greatly improved grain handling facilities in the country and at the ports.

On March 16th, 1908, the Grain Exchange of Buenos Aires put into force a future market system similar to that in American markets. Buenos Aires quotations are now received in the European and American markets daily.

According to a report by the International Bureau of American Republics, the railways in operation in Argentina at the close of 1906 had a total mileage of 12,900, while 3,500 miles additional was under construction. While the net profits of railroad operations for 1906 showed a gain of only 4 per cent., it was due to increased cost of labor and material. The number of passengers carried was 32,501,400, as compared with 17,813,700 in 1900. The freight transported amounted to 26,742,600 tons, as compared with 12,725,600 in 1900. The capital invested was $627,230,000. Rolling stock

included 2,116 locomotives, and freight cars having a capacity of 872,000 tons.

Work on the State lines has been steadily pushed, especial effort being directed toward reaching the Bolivian frontier, this line being part of a vast programme of international connections.

New railways are being constructed in every part of the country. Various railroad companies, such as the Southern, Western, Buenos Aires, and Rosario, and Argentine Central have in project the construction of several railroad lines. A narrow-gauge line is under construction to connect Buenos Aires with Rosario and the northern lines, while another scheme includes the establishment of a train ferry across the River Parana to link the Provinces of Entre Rios and Corrientes with Buenos Aires.

The Argentine government in 1906 placed before German shipping companies the conditions under which it is proposed to grant a subsidy for a steamship service between Argentina and Europe. The ports of Marseille, Barcelona, Cherbourg, Southampton, Havre, Naples, or Bordeaux might be called at, although, the enterprise aimed at regular connections between Hamburg and Buenos Aires. It was expected that the time between these two ports would be fifteen days and six hours, and twenty-four trips are to be made in each year. The subsidy was to be for ten years, and amount to a maximum of $56,000 gold per month. The vessels are to fly the Argentine flag, and all are to be placed in service within two years from the conclusion of the agreements.

A new steamship company, known as the "Unione Societa Anonima di Navigazione," with a capital of £833,332, was formed at Trieste, and a monthly passen-

ger and freight service between Brazil and Argentina was inaugurated. One-third of the capital was furnished by the Austrian Lloyd Steamship company and the remaining two-thirds by the "Unione Austriaca," formerly the Austro-Americana. It was proposed to double this service at the beginning of the year 1907, the sailings to take place fortnightly to and from the two countries interested. The fleet was to be composed of three cargo steamers of the Austrian Lloyds and three passenger steamers of the "Unione Austriaca."

* * *

The metric system of weights and measures is used exclusively in Argentina, as it is the official system. The following weights, measures and terms are used:

Kilo.—Kilogram, the metric weight, equal to 2.2046 pounds avoirdupois.

Hectoliter.—Of wheat, 2.838 bushels.

Ton.—The metric ton is equal to 1,000 kilos, or 2,204.6 pounds avoirdupois, or 36.74 bushels of wheat.

Hectare of Land.—2.471 acres.

Square of Land.—4.17 acres.

League of Land.—A square league, the term generally used, is equal to 6,672 acres, and the metrical league is equal to 6,178 acres.

Kilometer.—0.621 mile.

Meter.—39.37 inches.

Chacra.—A farm devoted exclusively to general agriculture.

Chacarero.—A man who works a chacra.

CHAPTER XXI.

WESTERN CANADA.

Great Immigration—A Vast New Wheat Country—A 2,000-Mile Trip—What the Country Looks Like—Prairies and Brush Lands—Saskatchewan Valley—Factors of Uncertainty—Why so Long Undeveloped—Prices of Lands—Settlers From the United States.

Author's Note.—On September 1st, 1905, the territories of Saskatchewan and Alberta were admitted as provinces. Alberta absorbed 50 miles off the western part of Saskatchewan and Assiniboia, while Saskatchewan absorbed all the remainder of Assiniboia. Saskatchewan now extends from the North Dakota line northward just beyond the 55th parallel. This province is now nearly 400 miles square.

In 1905 a man seeking an investment had his attention called to Western, or Northwestern Canada, as the provinces of Manitoba, Saskatchewan and Alberta are called. He bought 4,000 acres of land in southern Alberta, which is a winter-wheat country, paying $5 an acre. In 1906 he hired 170 acres broken, hired the seeding done; and in 1907, after hiring all the work of harvesting and threshing, marketed the crop and found that he had a profit of $7 an acre on the area under cultivation. Furthermore, he was offered $15 an acre for his 4,000 acres, but refused to sell.

This is but one of a thousand incidents of a somewhat similar nature that could be told of in connection with the Canadian West and particularly that part of it, Saskatchewan, that is destined to become—but why predict? the country speaks for itself. Since 1901 thousands of farmers from the United States and Eastern Canada have bought land and paid for it from the pro-

ceeds of one crop. Such facts as these, backed with the money to prove them, have been the direct cause of the greatest rush for farm lands in the world's history.

As a result of the great immigration into the Canadian West, or that part of it of which Winnipeg is the eastern gateway and the Rocky Mountains the western boundary, it has rapidly advanced to one of the most important wheat-growing countries. This importance is not in the amount of wheat grown, but in the large percentage of the crop that is exported and in the possibilities for the future.

Western Canada has (1) the area, (2) the soil, (3) the climate, (4) the people, and (5) the railroads to make it, within a few years, one of the three greatest wheat-growing countries. The first three factors are there, while the people and the railroads are coming more rapidly than they ever before invaded a new country.

This great wheat country is comparatively but a small corner of Canada, just north of North Dakota and Montana, extending northward some 300 miles, and west of Winnipeg for 1,000 miles.

As yet but a small part of this area is under cultivation: furthermore, this is not all of the Canadian Northwest that may be cultivated. One hundred miles farther north, to the 55th parallel, which is the northern boundary of Saskatchewan, will doubtless some day be included in the wheat territory.

A 2,000-mile trip in Manitoba and Saskatchewan, in August, 1905, was made by the writer for the express purpose of observation. Traveling is easy, for the provinces are well supplied with railroads. There is one trans-continental road with a dozen branches, and two

new trans-continental lines building. The roads are hardly keeping pace with settlement, although branches are being built as rapidly as there seems a demand for them.

The route traveled on this trip was south from Winnipeg, in the Red River Valley, across southern Manitoba and through the central and western parts, throughout the eastern half of southern Saskatchewan, northward to Battleford and back to Winnipeg from northwestern Manitoba. This route was through the old and well-established farming communities with their thriving towns and villages; through the newly-opened country, where farms were but one, two or three years old and where railroad stations still bore the fragrance of new lumber; and then through miles and hundreds of miles of virgin prairie or brush country as fertile as the lands under cultivation and which now yield 25 bushels of wheat per acre. There is land enough in this northwest for hundreds of thousands of farms—enough to grow a billion bushels of wheat.

This part of the Canadian Northwest may, generally speaking, be described as either prairie land, level or gently rolling, or "brush land", i. e., lands covered with a dense growth of small poplar trees or different varities of low brush.

Winnipeg, on the Red river, which flows north, is not in an agricultural district. The Red River Valley proper extends east and west from 20 to 30 miles from the river. The land is low and as level as if Nature had laid it out with a spirit level. Unlike the valley across the line to the south, in Minnesota and North Dakota, it is not generally under cultivation; much of it is meadow-land. Thirty miles or so west of the river the

country is higher, and there really begin the prairies, or plains, which extend, gradually rising, and broken here and there by streams and ranges of low, brushy hills, 700 miles to the Rocky Mountains. This is the northern extension of the great prairie country of the Dakotas, Nebraska, Kansas, Oklahoma and Texas; and in early frontier days the buffalos roamed at will, in their migrations, from Texas to northern Saskatchewan, undisturbed except by the Indians.

Fully three-fourths of the wheat lands now under cultivation in the Canadian West are in the southwestern quarter of Manitoba and the eastern southern half of Saskatchewan. A little west of Moose Jaw is the limit of the zone of sufficient moisture. Westward to the mountains is the "dry country"; and in southern Alberta irrigation is becoming an important factor in agriculture, and winter wheat is raised on a considerable scale.

But it is the country to the north, the great Saskatchewan Valley and adjacent territory, that promises to change conditions in the wheat markets of the world.

This great territory extends from northwestern Manitoba westward through central Saskatchewan for over 500 miles, into Alberta.

Central Saskatchewan is a great prairie country with much brush land and with many streams, ponds and small lakes. The soil is of wonderful richness, black and of great depth. It will not wear out with a few years of crops. Here and there the prairie is level for many miles, and unbroken save for occasional clumps of brush. Again, it is gently rolling, with half a dozen small lakes in view, and the landscape broken by brush, district of Saskatchewan, where good farming is the

which, in the distance, has the appearance of groves about farm houses. Then, for miles, the traveler passes through the real brush country, where there is no open prairie land, and where clearing will be necessary before crops can be planted. In August the whole country was green, and had the appearance of being under cultivation. Yet these thousands of square miles of rich lands have hardly been touched by the plow. They lie as they have since the beginning, blossoming in the spring-time, bringing forth their crops of grasses or leaves to wither in the fall; repeating this year after year, and century after century, awaiting the coming of man with the plow, the seed and the railroad.

Where they have been cultivated one, two or three years, crops of wheat averaging 20 to 30 bushels per acre are grown. In the vicinity of Saskatoon, over 400 miles northwest of Winnipeg, for instance, where in 1902 there was only an occasional farm, the country for miles around appeared to be all in wheat. The fields were heavy with the grain, and an average yield of 25 bushels per acre seemed assured.

This is in the Saskatchewan Valley, and is fairly representative of what the country for over 200 miles east and 300 miles west is capable of.

Four hundred and fifty miles "as the crow flies" northwest of Winnipeg, at Prince Albert is the farthest point north where wheat is grown to any extent. This is in the Saskatchewan Valley, in latitude 53-10, 600 miles, approximately, from Hudson Bay. It is 1,400 feet above sea level. For a series of 11 years the average precipitation here has been 17.93 inches. The minimum annual precipitation was 9.6 inches, and the maximum 29.88.

At Edmonton, 325 miles west of Prince Albert, the average precipitation for a series of thirteen years was 18.44 inches. The altitude of Edmonton is 2,150 feet.

Regina, 350 miles west of Winnipeg, during seven years, had an average precipitation of 14.77 inches.

The "dry country" lies to the south and west of Regina.

Wheat growing has been in progress long enough in Manitoba and part of Saskatchewan to be long past the doubtful stage. While there have occasionally been years of small yields, the steady increase in acreage points conclusively to an established basis of certainty as far as the country has been developed.

The two factors of uncertainty in the newer districts are early frosts in the north and drouth in the west. Every new country is beset with uncertainties and has to prove itself. During the early years of settlement in North Dakota frosts in August were a continual menace, and fears of drouth kept agriculturists from the western part, where good crops are now the rule. Much of South Dakota, a few years ago, where now are prosperous towns and beautiful farms, was regarded as in the arid district, and unfit for agriculture. In Nebraska and Kansas many of the first settlers were starved out and left the country in disgust; while in Minnesota, the most prosperous state in the West, the Rocky Mountain locusts, or grasshoppers, consumed the crop for three years in succession.

Drouth is something that cannot be overcome except by irrigation, but it can be avoided. Danger of damage by early frosts can be overcome. It is only a matter of sowing the right kind of wheat at the right time, so it will mature before frosts come. In the Indian Head

rule, frosts had not damaged the grain for many years, until 1907.

Nevertheless, the crops of Canada and North Dakota were seriously damaged by frost in August, 1907, The spring was very late, cold and rainy, retarding the growth of all vegetation. Frosts came early in the autumn, while rains prevented the grain from ripening.

This was not a local condition, however, for the crops of the country were light, and the same general unfavorable conditions prevailed throughout Europe.

The climate of southern Alberta is much milder than that of Manitoba and Saskatchewan.

On August 19th, 1905, when the writer left Winnipeg for his trip through the wheat country, harvest was just beginning in the extreme southern part of the provinces. One week later it was general over the whole country. This indicates how rapidly the wheat ripens under perfect weather conditions.

Wheat seeding in Manitoba and Saskatchewan begins as early in the spring as the weather will permit, and may continue to June 1st; but from April 15th to May 15th is the desirable period.

Settlement has been so rapid and development so great since 1901 in Western Canada, that the question naturally arises, If the lands are good and the climate suitable, why has the country been unoccupied so long?

In 1884 but 300,000 acres of land in all Manitoba was in wheat, and, all told, but 500,000 acres was under cultivation. In 1907 the area in wheat in the three provinces was over 5,000,000 acres.

There are two reasons why this country remained undeveloped so long. One is that the cheap lands in

the United States were not exhausted. The other reason is that the country was given a bad reputation many years ago. The whole Northwest, practically, was the domain of the Hudson Bay Company, and settlement and agriculture were inimical to the company's interests. And, as in early days this company's reports were the main sources of information, the country became known as too cold and barren for agriculture.

It remained for Americans, men from the Twin Cities, to rediscover a larger part of this new country, that is, the Saskatchewan Valley. Canadians, even residents of Winnipeg, who had great confidence in the development of the country west of Winnipeg, were under the impression that the lands to the northwest, in Saskatchewan, were unsuitable for agriculture. This was only in 1901.

A party of American capitalists, however, after seeing the lands of the Saskatchewan Valley, believed otherwise. Contrary to the advice of their Canadian business associates, they purchased outright 2,000,000 acres, and encouraged settlement. In 1905 these lands, which, four years before were regarded as of little value, bore 20 to 30 bushels of wheat per acre.

Had it not been for a veritable farm-land boom in the United States, beginning in 1901, Northwestern Canada might have been another 20 years in developing as much as it did in four years; for the taking up of new lands has mainly been by Americans, though much was done by Canadians from the East. Settlement by Europeans has been small and not of the kind that builds nations. But the Canadians from the East and the Americans, from Illinois, Iowa, Minnesota and the Dakotas, came with money, energy and experience.

They were therefore prepared to begin farming at once on a large scale.

A few years ago good lands could be bought for from $1 to $2 per acre, as compared with $7 to $10 in 1905, and somewhat higher prices in 1908; and, besides, there was free land for the homesteader.

These cheap lands looked good to the farmers in the States, whose lands were worth $40 to $100 per acre; and to farmers' sons, who could not buy a farm because of the price.

An exodus began in 1901 from many localities of several states, particularly Iowa and southern Minnesota. Whole families, including father and grown sons, and their neighbors, would go in little colonies. How freely they went is shown by the census of 1905. Iowa, from the previous census, decreased in population, and two of the southern congressional districts in Minnesota decreased in population between 1900 and 1905. A third district increased less than 1 per cent.

One reason for the more rapid development of Western Canada than any other country has ever enjoyed, is that the settlers were not pioneering in the sense usually understood. They came, as a rule, with money, implements and experience. They did in one year as much as the pioneers of the American West did in five. Furthermore, the railroad facilities are infinitely better than when the West was settled; and the branch banking system of Canada is a great aid to the building up of a new country. Also, the farmer in this new country now gets a relatively higher price for his products than when the American West was young; and the cost of production is less. Many of the Canadian farmers ship their wheat to the Winnipeg market, as compared with the

American farmer, in the early days, paying the local grain buyer an exorbitant profit.

The differences between settling and developing this new Northwest and the American West is so great that it will have a million new people and established prosperity before the world realizes what is going on.

CHAPTER XXII.

WESTERN CANADA (Concluded).

Wheat Growing Farthest North—Area and Crops in Saskatchewan—Great Possibilities—Acreage in Wheat—Wheat Crop of Canadian West—Grain Handling—Terminals at Fort William and Port Arthur—Railroads—Hudson Bay Route to Europe—Exports From Canada—Ice Breaking at the Head of Lake Navigation.

It is a matter of interest rather than of immediate importance to trace wheat growing to its farthest point north in Canada. This point is at Fort Vermillian, in Athabasca, in latitude 58-30, longitude 116, 600 miles north of the Montana-Alberta boundary.

Doubtless the longitude is an important factor, for Fort Vermillian is in the Peace River Valley, where the climate is tempered by the proximity of the mountains and the chinook winds.

This is a long distance beyond the northern boundary of Alberta and Saskatchewan, and is farther north than wheat is raised anywhere else in the world excepting in the government of Perm, in eastern Russia, and perhaps in parts of Siberia.

At Fort Vermillian the Hudson Bay Company has built a mill, and the wheat ground in it is all raised in the vicinity. Wheat has been grown in the Peace River Valley in latitude 56 since 1893, though, of course, in a very small way. It is expected that this country will be opened for settlement in a few years, for a railroad is heading that way.

While Alberta will increase largely in wheat growing, and although the western part of Manitoba has mil-

lions of acres not yet under cultivation, it is Saskatchewan that will supply the great increase in wheat acreage. The province has an area of 251,880 square miles, of which 6,920 square miles is water surface. In 1906 only 2,500,000 acres was under crop. To use a common expression, the surface of Saskatchewan has as yet only been scratched. The number of grain farms in the province was 30,289, with an average area under crop of 82.57 acres.

One who travels in Saskatchewan, or sees as much of it as can be seen from railroad trains, is impressed with the great percentage of "good" land—that which will ultimately be under cultivation.

Up to the year 1908 the greatest crop of wheat ever grown in the three provinces was in 1906, when the final estimate was 94,500,000 bushels.

There is a difference of opinion regarding the acreage in wheat, and it has increased so rapidly that estimates have had to be radically revised every year. For 1906 and 1907, however, the estimate made by the Northwest Grain Dealers' Association, of Winnipeg, is 5,013,500 acres. There was no increase in 1907 because of the late and unfavorable spring. For various reasons, however, this estimate seems too low; and it is probable that the area in wheat in those two years was 5,250,000 acres.

Manitoba's greatest crop was in 1905, when the official estimate made the total 55,760,000 bushels, on 2,643,000 acres. The average yields in different districts ranged from 15 to 35 bushels, and the total for the provinces was 21 bushels. The 1905 acreage was 231,000 greater than that of 1904.

The wheat crop of Manitoba, Saskatchewan and Alberta from 1899 to 1907 was as follows:

	Bushels.	Per Acre.
1907	*65,000,000	13
1906	94,500,000	18.9
1905	86,800,000	21.6
1904	57,900,000	....
1903	50,300,000	....
1902	67,000,000	....
1901	63,300,000	....
1900	17,100,000	....
1899	34,800,000	....

*Very unfavorable weather in the spring and frosts in August.

With the exception of the winter wheat grown in Alberta and in limited areas elsewhere, the varieties of wheat are almost exclusively fife and blue-stem. In a normal season a large percentage of the crop grades, in the Winnipeg market, No. 1 hard or No. 1 northern. It is hardly necessary to say that Manitoba and Saskatchewan wheat is of fine quality.

In a general way, wheat is marketed, handled, transported and stored in the same manner in Western Canada that it is across the border in the United States. There are "line" elevator companies, with headquarters at Winnipeg, that have "houses" or elevators at the country stations, where their agents buy the grain from the farmers. The latter haul their grain to the stations in bulk and not in bags, as is done in many countries and in the Pacific coast states of the United States. The grain is transported in bulk from the time the farmer sells it until it is finally loaded on to Atlantic steamers.

The farmers themselves probably ship more grain to market (Winnipeg) in Western Canada than do the

farmers of any other country. The railroads provide "sidings" or tracks and build platforms at country points, which enable the farmers to haul their loads up to the car door and shovel the grain into the car. They then ship the grain to some commission house.

Winnipeg is the only great market center of Western Canada, but it is not a terminal point. The great storage elevators are at Fort William and Port Arthur, Ontario, on Lake Superior. Winnipeg prices have as a basis Fort William. That is, if an exporter buys Winnipeg May wheat, it will be delivered to him from the elevators at Fort William.

Storage capacity at the many railroad stations has kept pace with the rapid increase in wheat growing. Every station has from one to five elevators, and the total capacity is approximately 30,000,000 bushels.

The large terminal elevators at Fort William and Port Arthur have a combined capacity of 18,500,000 bushels. Most of these elevators are of modern fireproof construction. For example, the "workinghouse" of one of the large plants burned in 1907, but the steel storage tanks with a total capacity of 3,000,000 bushels were not damaged. The Canadian Pacific and Canadian Northern railroads own immense elevators at these lake ports; in fact, they built almost the entire capacity.

Western Canada has three trunk lines of railroad, all of which will ultimately be built through to the Pacific coast. The latest, the Grand Trunk, has not yet built eastward to Lake Superior, but this, of course, is only a matter of time. The Canadian Pacific has a wonderful system in this western country, and has built thousands of miles of branch lines throughout the southern part of the three provinces.

The Canadian Northern reaches from the lake through Winnipeg and on to the northwest to Edmonton. It is now building southwest from Saskatoon, in northern central Saskatchewan, to southern Alberta, thereby opening a vast expanse of new wheat lands.

THE HUDSON BAY ROUTE.

Yet perhaps the most remarkable of all the developments under way in this great Northwest, is the building of a road by the Canadian Northern from a point in Saskatchewan near the northwestern corner of Manitoba to Hudson Bay, directly to the northeast. In 1907 about 100 miles of this road had been completed.

The road to Hudson Bay was definitely decided on in 1905 or earlier, though it was generally declared visionary. In that year Mr. William Mackenzie, president of the Canadian Northern, told the writer that the road would be completed in five years. It was asserted at that time that as soon as the rails were laid to the Bay, a steamship company would establish a line of steamers to ply between Europe and the Canadian port.

Investigation as to the feasibility of the new water route, Mr. Mackenzie asserted, dispelled some of the uncertainties that have long obtained regarding it. Yet it is doubtless a fact that so little is generally known of the possibilities, or impossibilities, of navigation on Hudson Bay, is because there has never before been a real commercial need of an outlet for Canada via the Bay. A very large percentage of the wheat must find a market in Europe, and it is beyond the capacity of the railroads to haul the grain offered before the close of navigation on the lakes. This will result in much grain being carried through the winter at lake ports, although

some, of course, will take the long all-rail haul to the seaboard.

The advantages of the Hudson Bay route cannot be over-estimated. It means that the center of this great wheat country will be as near a seaport as it is now to Lake Superior. Practically the whole haul from Fort William, on Lake Superior, to the seaboard will be eliminated. Furthermore, the Northwest will receive its European supplies at greatly reduced freight rates and minus Eastern jobbers' profits.

The branch of the Canadian Northern road that is being built to the Bay will extend to the northeast some 600 miles to Fort Churchill. Then the water route is across Hudson Bay and through Hudson Strait to the ocean, a distance of 1,000 to 1,200 miles. Fort Churchill to Liverpool is the same distance as from New York to Liverpool.

A prevalent impression is that navigation on Hudson Bay is only possible for three months of the year—July, August and September. This, however, is an error. In fact, the contrary is the case. Navigation during the summer months is not practicable, because of the ice-floes. The season of navigation would begin in the fall and extend to the beginning of the following summer, with January the best month. Of course, ice-breakers would be necessary at the port.

Fort Churchill is in latitude 58 degrees north, and the steamship route would be northeasterly, with the farthest-north point in Hudson Strait, at 63 degrees.

This Hudson Bay route is not so far north by many degrees as the northern outlet of Russia, which is the White Sea. Archangel, the most northern port of Russia, is just below the 65th parallel and but 150 miles

south of the Artic Circle. Vessels from this port sail northward, around Lapland and the northern extremity of Norway, latitude 72.

Archangel is one outlet for Siberia, via a railroad running northwest from the Siberian road to the Dwina river in Russia, thence down the Dwina, which empties into the White Sea at Archangel.

The Hudson Bay route seems easy by comparison, as far as latitude and the handicaps of climate are concerned.

CANADIAN WHEAT AND FLOUR EXPORTS.

Export shipments of wheat and flour from Canada for four seasons, with destination, are shown in the following table:

Exports from the whole of Canada for the crop years from July 1, 1902, to June 30, 1906:

	1902-03.	1903-04.	1904-05.	1905-06.
Wheat, bus.....	32,986,000	16,779,000	14,700,000	40,399,000
Flour, bbls.....	1,288,000	1,588,000	1,321,000	1,532,000
As wheat, bus...	38,782,000	23,925,000	20,644,000	47,293,000

In 1903 and again in 1904, the wheat crop was light; 1904 was the "black rust" year.

For the season from July 1, 1905, to June 30, 1906, the exports were distributed as follows:

	Wheat, bus.	Flour, bbls.
To Great Britain.....	36,027,692	943,777
To United States.....	3,831,988	25,772
To Other Countries.....	539,720	562,465
Total	40,399,400	1,532,014

The exports to the United States were in bond for shipment from American ports.

ICE BREAKING AT THE HEAD OF CANADIAN NAVIGATION.

Thunder Bay, on which are located Fort William and Port Arthur, is the head of navigation on the

Canadian side of Lake Superior. It is, of course, of the greatest importance that navigation should open at the earliest possible day, and be kept open as late as the passages below the Soo will permit. An experience with an ice breaker in the spring of 1907 was so satisfactory that resolutions were passed by the Winnipeg Grain and Produce Exchange, recommending that the Government of the Dominion of Canada grant the owners of the ice breaker "James Whalen" a contract for a term of years to open navigation as early, and to keep it open as late, as possible.

Owing to the unusually severe winter of 1906-07, an ice field was formed from Thunder Bay out in the lake for a distance of forty miles. In the middle of April the ice was thirty-six inches thick ten miles from shore. It was the opinion of men competent to judge that navigation would not open before May 24th; and the situation was becoming rather acute in April. The fuel supply was low in Western Canada and the railroad companies were also running short of coal. The elevators at Fort William and Port Arthur were filled to their capacity with grain awaiting shipment down the lakes.

It was at this stage of the situation that the ice breaker came to the relief of the whole of Western Canada. After many days of hard work, the vessel succeeded in breaking its way through on April 29th. And so navigation was opened and let in seven vessels that had been waiting at the edge of the ice; enabled the railroad companies to get their supplies of coal, and relieved the congestion of grain in the elevators.

CHAPTER XXIII.

THE UNITED STATES—AMERICA.

Three Divisions—East of the Mississippi—The West—The Pacific Coast States—Development of Wheat Growing—Influence of the Reaper—Status of Wheat Growing in the Old States—Exports of Wheat—Crop of the Country—Statistics: Wheat Crop 1840 to 1907; Crop by States; Wheat Acreage by States; Yield Per Acre by States; Exports of Wheat and Flour 1870 to 1907; Exports by Ports.

AMERICA naturally separates itself into three divisions or regions, when one begins to consider it as a wheat-growing country. The first great division, and the oldest, is made up of the wheat states east of the Mississippi, and perhaps includes Missouri. This is the region of the soft red winter wheat. The most important division consists of the real prairie or plains country, "the West" proper, or Minnesota, the Dakotas, Nebraska, Kansas and Oklahoma. The third region was decided upon by nature and is separated from the rest of the country by the Rocky Mountains. The important wheat-growing states in it are Washington, Oregon, Idaho (the western part) and California. This region is as distinct in its agricultural interests from the rest of the United States as if it were a foreign country. Very little of its wheat is shipped eastward, and its crops are of more importance to the importers of Europe than they are to the millers and the bread-eaters east of the Rocky Mountains.

The position of the United States among the wheat-growing countries is very different from that of any other country. It is not only the greatest wheat pro-

ducer and the greatest consumer, but it is also one of the three most important wheat-exporting countries. Russia, with a greater population, raises less wheat and exports approximately the same amount. India, with an immensely greater population, raises less than half as much and exports from nothing to 50 per cent. as much as the United States. France has a population less than fifty per cent. as great as the United States and raises nearly half as much wheat and is usually a moderate importer. Argentina, with a population about equal to that of Minnesota, the Dakotas and Kansas, in 1907-08 raised only 29 per cent. as much wheat as the United States, but the exports will approximate those of America from its great crop of 1906.

But America also differs from all other countries in that its population is increasing at a rate never equaled in the world's history. This is a matter of prime importance in connection with the country's position among the wheat-exporting countries.

While it would be interesting to trace the growth and development and increase of wealth in the United States as directly influenced by wheat—how the westward march of the pioneers and first settlers was made possible; and how diversified farming followed in the wake of wheat and in turn built a substantial foundation for the cities with their factories, which came last—while this would make a story of absorbing interest, the pleasant task of telling it, even if he could, is not for the author of this volume. His work is rather to touch very briefly upon statistical matters and to endeavor to outline the wheat-growing situation as it is today.

While wheat growing could not have been held back in America, owing to the climate, the soil and the in-

creasing population, its rapid increase from late in the 50's was made possible by the invention of the reaper. Without machines for cutting grain, another hundred years must have passed before America could have raised as much wheat as Russia; for enough laborers could not have been found.

The first grain was cut with a reaper in 1831, by Cyrus McCormick, in Virginia. Up to 1844 McCormick had sold but eight reapers outside of Virginia, and those went to Ohio. In 1845 and 1846 he sold 240. In 1847 he built a factory in Chicago, and in 1851 he turned out 1,000 machines. In 1859 there were 50,000 reapers in the United States; and the destiny of the great prairies from Indiana to the Rocky Mountains was clearly defined. The most wonderful march of development in the world's history had begun; and the greatest war the world has ever known could only check it for a brief period.

The rapid increase in the wheat crop of the country continued until 1882, but from a five-year period in the early 80's the average was not materially increased until 1897 was passed. From that year the country entered into a new era in which a crop of 600,000,000 bushels is regarded as moderate.

The wheat crop of the country since 1840 is shown in Table I at the close of the chapter. The crop by states from 1901 to 1907 is given in Table II.

The great increase has, of course, been in the Western and Pacific Coast states; and yet the crops of some of the older states are of particular interest, as showing the trend of wheat growing.

Pennsylvania, for instance, shows a decided increase since 1883 to '85, and the acreage has been large and

the average yield high since 1891. This seems to indicate that wheat growing is on an established basis in this old state and that any material decrease need not be expected.

The crop of Ohio averages as great now as it did from 1883 to '85, and large crops were raised in 1906 and '07. The yield per acre in 1906, which, however, was a phenomenal year, was 20.4 bushels.

Michigan has declined as a wheat grower, and its crops since 1901 have only been half what they were from 1883 to '85.

The great prairie state of Illinois, however, which has been growing wheat for sixty years, has increased its acreage in wheat since 1885. Indiana is also now cultivating the greatest wheat acreage it has ever had.

Wisconsin and Iowa, spring wheat states, have since 1885, given over a large wheat acreage to other crops.

The following table shows the changes that have taken place in the wheat crop of states mentioned since 1883.

	1907.	1906.	1884.	1883.
Pennsylvania	30,095,000	29,073,000	18,000,000	20,000,000
Ohio.....	30,677,000	43,200,000	41,200,000	25,800,000
Michigan	12,731,000	13,644,000	29,772,000	25,000,000
Illinois	40,104,000	38,535,000	32,375,000	22,100,000
Wisconsin	2,955,000	4,690,000	20,083,000	19,600,000
Iowa	7,653,000	9,212,000	31,270,000	27,500,000

The acreage in wheat in the different states of the country is shown in Table III at the close of this chapter, and the average yield per acre in Table IV.

While wheat is the crop of a new country, and while diversified farming follows general wheat growing, the large acreage now under wheat in the old states of Pennsylvania, Ohio, Indiana, Illinois and Missouri, gives promise of a continued large acreage of wheat in

the West after the states have become thickly populated. Even the exceedingly small yields of 6 to 8 or 9 bushels an acre year after year in half a dozen Southern states having each half a million to a million acres in wheat, do not discourage the growing of it.

In this connection something might be said of fertilization and crop rotation, but these subjects will be reserved for a separate chapter.

In the first division outlined at the beginning of this chapter, the wheat grown, except in a few unimportant localities, is the soft red winter. This variety was the standard wheat of all the markets until the Northwest began to come into prominence as a spring wheat region.

In the grain trade today "the West" consists of the Northwest (Minnesota and the Dakotas) and the Southwest (Nebraska, Kansas and Oklahoma). The Northwest is the great spring wheat region, and the Southwest the important hard winter wheat district.

These two regions are of particular importance in the commercial and the financial world because they are still making history. They have not yet settled down to a routine existence. Still, the Northwest is approaching an established basis in wheat growing, and it is quite certain that it has already made more history with its wheat and its flour than it can create in the future.

But before entering upon the Northwest, the export trade of the country might be glanced at; and a record of the wheat and flour exports from 1870 to 1907 and the exports by ports from 1902 to 1907 are given at the close of this chapter in Tables V and VI.

Exports from the Pacific Coast ports are shown in the chapter on that region.

There are two sides to the export business, and it is probable that the general commercial and financial interests see but one. That is, they see wheat going out of the country, and they know this is favorable to the balance of trade.

A big exportable surplus of wheat means that the American farmer is competing with the farmers of all the exporting countries of the world. But the French and German farmers are meanwhile getting 10 to 30 cents a bushel more for their wheat, relatively, because France and Germany raise less wheat than they consume.

Therefore it appears that an export business in wheat is good, because it brings European gold into the country; and bad, because it means lower prices to our farmers. There are occasional exceptions to the latter conclusion, however; and the season of 1907-08 was a notable one.

In considering the export business one should not confuse wheat and flour—the raw material and the manufactured product.

The decline of the export trade since 1898, although the wheat crop has been well maintained, seems to indicate conclusively that the exports will never again reach the average of 1898 to 1902.

The following table gives the total crop of the United States from 1898 to 1907, and the exports of wheat and flour, in bushels:

Crop Year.	Crop, Bus.
1898	*696,000,000
1899	*576,000,000
1900	*592,000,000
1901	748,460,000
1902	670,063,000
1903	637,821,000
1904	552,400,000
1905	692,980,000
1906	735,260,000
1907	634,087,000

* Commercial estimates.

Year ending June 30.	Exports, Bus.
1899	222,600,000
1900	186,100,000
1901	216,000,000
1902	234,772,000
1903	202,900,000
1904	121,000,000
1905	44,000,000
1906	97,000,000
1907	147,000,000
1908	.....

Yet except in a season of very short crops, such as 1904, the United States will doubtless be an exporter of 100,000,000 bushels annually for several years to come. With the present average crop of somewhat over 650,000,000 bushels, the country will be an exporter until the population reaches 100,000,000. Even then we shall have a moderate surplus; and in the event of another 735,000,000 bushel crop, we can spare fifty to seventy-five millions.

It is probable that the country is many years away from being an importer, except in crop-calamity years. And there is yet the question of crop rotation and intensive farming; and but little little attention in this direction would raise the average yield one bushel an acre. This would add nearly fifty millions to the crop of the country.

TABLE I.

Wheat Crop of the United States.

	† Bushels.		
1840	84,821,000		
1850	100,164,000		
1860	170,176,000		
1862	186,763,000		
1863	190,888,000		
1864	160,696,000		
1865	148,523,000		
1866	152,000,000		
1867	212,441,000		
1868	224,036,000		
1869	260,147,000		
1870	235,885,000		
1871	230,722,000		
1872	249,997,000		
1873	281,255,000		
1874	309,103,000		
1875	292,136,000		
1876	289,356,000		
1877	364,194,000		
1878	420,122,000		
1879	448,757,000		
1880	498,550,000		
1881	383,280,000		
1882	504,185,000		
1883	420,155,000		
1884	512,764,000		
1885	357,112,000		
1886	457,218,000		
1887	456,329,000		
1888	415,868,000		
1889	490,560,000		
1890	399,262,000		
	*		
1891	688	611,780,000	
1892	576	515,949,000	
1893	480	396,132,000	
1894	528	460,267,000	
1895	488	467,103,000	
1896	472	427,684,000	
1897	592	530,149,000	
1898	696	675,149,000	
1899	576	547,304,000	
1900	592	522,229,000	
1901		748,460,000	
1902		670,963,000	
1903		637,821,000	
1904		552,400,000	
1905		692,980,000	
1906		735,260,000	
1907		634,087,000	

	Winter.	Spring.
1901	355,685,000	166,543,000
1902	471,682,000	276,778,000
1903	415,398,000	254,664,000
1904	401,686,000	236,136,000
1905	325,374,000	227,026,000
1906	419,482,000	273,498,000
1907	492,462,000	242,798,000
	403,908,000	230,179,000

* Commercial estimates, in millions, 000,000 omitted.

† Estimates of the Department of Agriculture.

Previously to 1903 Nebraska was included in the spring wheat states. In the foregoing table for the years 1900-'01 and '02 Nebraska has been deducted from the spring wheat totals and added to the winter, in order that the totals may be compared with those of later years.

TABLE II.

Wheat crop of the United States, by states, showing both winter wheat and spring wheat. From the records of the Department of Agriculture.

Winter Wheat States.	1907. Bushels.	1906. Bushels.	1905. Bushels.	1904. Bushels.	1903. Bushels.	1901. Bushels.
Ohio	30,677,000	43,202,000	32,197,000	17,563,000	28,303,000	33,532,000
Michigan	12,731,000	13,644,000	19,003,000	6,873,000	15,524,000	13,702,000
Indiana	34,013,000	48,080,000	35,351,000	12,525,000	23,991,000	31,932,000
Illinois	40,104,000	38,535,000	29,951,000	21,542,000	16,571,000	30,052,000
Missouri	29,212,000	31,734,000	28,022,000	27,163,000	22,194,000	31,137,000
Kansas	65,609,000	81,830,000	77,001,000	65,019,000	94,041,000	90,330,000
Nebraska	45,911,000	52,288,000	48,002,000	31,453,000	42,157,000	*42,000,000
Kentucky	8,808,000	11,542,000	8,809,000	7,349,000	7,728,000	11,611,000
Tennessee	7,400,000	10,892,000	6,348,000	9,298,000	7,693,000	13,094,000
New York	7,197,000	9,350,000	10,300,000	5,362,000	9,683,000	7,831,000
New Jersey	1,998,000	2,038,000	1,805,000	1,392,000	1,588,000	2,062,000
Penn.	30,095,000	29,073,000	27,869,000	21,857,000	26,038,000	28,660,000
Delaware	2,460,000	1,947,000	1,669,000	1,676,000	1,167,000	2,096,000
Maryland	14,763,000	12,902,000	13,196,000	10,327,000	10,120,000	13,315,000
Virginia	8,188,000	9,306,000	8,418,000	7,257,000	6,999,000	9,680,000
N. Carolina	5,320,000	5,297,000	3,975,000	4,912,000	3,228,000	6,762,000
S. Carolina	2,669,000	2,960,000	1,942,000	2,267,000	1,756,000	2,280,000
Georgia	2,673,000	3,161,000	2,106,000	2,564,000	1,859,000	3,042,000
Alabama	890,000	1,085,000	1,041,000	1,060,000	1,020,000	1,155,000
Mississippi	22,000	17,000	28,000	25,000	28,000	38,000
Texas	2,812,000	14,126,000	11,117,000	12,483,000	19,880,000	6,062,000
Arkansas	1,463,000	1,915,000	1,564,000	2,198,000	1,922,000	3,126,000
W. Virginia	4,447,000	1,915,000	4,373,000	3,158,000	4,128,000	4,534,000
California	20,520,000	26,883,000	17,542,000	17,474,000	20,926,000	34,743,000
Oregon	15,265,000	14,215,000	13,382,000	14,050,000	12,438,000	17,158,000
Oklahoma	.....	18,663,000	11,764,000	15,040,000	24,482,000	20,558,000
Indian Ter.	8,631,000	2,890,000	2,702,000	3,474,000	2,996,000	2,424,000
W. Wheat	403,908,000	492,462,000	419,481,000	325,374,000	401,685,000	429,675,000

TABLE II.—Continued.

Spring wheat states—						
Minnesota	67,600,000	55,801,000	72,434,000	68,344,000	70,652,000	80,102,000
Wisconsin	2,955,000	4,690,000	7,893,000	7,483,000	8,365,000	7,576,000
Iowa	7,653,000	9,212,000	13,683,000	11,266,000	12,531,000	21,048,000
N. Dakota.....	55,130,000	77,896,000	75,623,000	53,892,000	55,240,000	59,310,000
S. Dakota.....	32,480,000	41,955,000	44,133,000	31,556,000	47,252,000	51,662,000
Colorado	8,497,000	8,266,000	6,358,000	5,917,000	7,423,000	7,531,000
Washington	35,045,000	25,075,000	32,516,000	32,140,000	19,986,000	34,518,000
Nevada	960,000	869,000	723,000	662,000	591,000	488,000
Idaho	8,639,000	8,231,000	10,341,000	6,832,000	5,127,000	6,241,000
Montana	4,003,000	3,297,000	2,843,000	2,596,000	2,784,000	2,353,000
Wyoming	855,000	871,000	748,000	520,000	473,000	952,000
New Mexico.....	1,104,000	1,120,000	947,000	440,000	822,000	3,698,000
Utah	4,637,000	4,888,000	4,710,000	4,793,000	4,156,000	567,000
Arizona	388,000	391,000	331,000	356,000	483,000	515,000
Maine	210,000	199,000	181,000	179,000	207,000	177,000
Vermont	23,000	27,000	27,000	40,000	35,000	32,000
S. Wheat.....	230,179,000	242,798,000	273,498,000	227,025,000	236,135,000	318,785,000
Total crop.....	634,087,000	735,260,000	692,979,000	552,399,000	637,821,000	748,460,000

* Nebraska is included in spring wheat states in the tables of the Department of Agriculture previously to 1903.

TABLE III.

Wheat acreage of the United States as compiled by the Department of Agriculture.

	1907. Acres.	1903. Acres.	1902. Acres.	1901. Acres.	1900. Acres.
Ohio	1,882,000	2,065,950	2,124,759	2,191,670	1,420,646
Michigan	878,000	1,001,600	1,056,114	1,234,499	1,219,969
Indiana	2,362,000	2,399,400	2,217,778	2,021,499	1,209,755
Illinois	2,228,000	1,972,850	1,821,337	1,707,503	1,383,236
Missouri	2,213,000	2,551,100	2,827,462	1,958,308	1,507,737
Kansas	5,959,000	6,181,176	4,395,319	5,355,638	4,660,376
Nebraska	2,535,000	2,687,314	2,525,150	2,456,540	2,066,820
Kentucky	734,000	920,028	807,692	959,603	957,142
Tennessee	779,000	1,083,531	840,381	1,212,441	1,181,423
New York	416,000	544,039	478,196	597,823	367,015
New Jersey	108,000	113,456	106,000	122,741	122,753
Pennsylvania	1,618,000	1,669,131	1,558,745	1,676,070	1,502,321
Delaware	120,000	114,489	108,660	113,329	72,864
Maryland	777,000	809,667	757,090	774,136	778,864
Virginia	655,000	804,550	637,806	888,091	791,759
North Carolina	560,000	633,060	576,558	777,255	620,917
South Carolina	314,000	270,261	267,673	259,160	238,092
Georgia	297,000	299,958	284,531	370,996	550,670
Alabama	89,000	112,133	105,486	132,788	96,458
Mississippi	2,000	3,569	3,488	4,389	4,248
Texas	380,000	1,483,595	959,253	681,126	1,271,517
Arkansas	154,000	274,654	246,801	355,325	266,279
West Virginia	367,000	404,785	356,264	416,004	454,377
California	1,368,000	1,868,410	2,052,679	2,672,547	2,771,226
Oregon	651,000	684,961	777,377	814,742	1,173,769
Oklahoma	959,000	1,643,130	1,087,747	1,253,580	981,967
Indian Territory	.....	249,691	201,750	198,727	.....
Total winter	28,405,000	32,846,500	29,182,100	31,106,100	27,672,200

TABLE III.—Continued.

Minnesota	5,200,000	5,393,328	5,737,853	6,209,500	4,905,643
Wisconsin	210,000	536,589	532,100	469,920	849,458
Iowa	569,000	1,010,472	1,174,891	1,295,689	1,397,322
North Dakota	5,513,000	4,349,652	3,954,229	4,527,530	2,689,023
South Dakota	2,900,000	3,424,130	3,604,347	4,004,830	2,920,224
Colorado	293,000	279,082	293,770	312,521	318,899
Washington	1,349,000	982,241	1,065,454	1,185,793	1,067,943
Nevada	30,000	21,426	19,839	19,450	40,457
Idaho	342,000	242,550	273,080	294,397	149,261
Montana	139,000	98,735	90,583	88,807	72,555
New Mexico	46,000	44,712	45,624	44,295	183,207
Utah	161,000	183,897	176,824	180,433	176,895
Arizona	15,000	19,129	18,754	26,047	25,045
Wyoming	30,000	22,667	23,130	21,027	20,819
Maine	8,000	8,132	8,383	7,419	2,090
Vermont	1,000	1,708	1,725	1,742	3,489
Total spring	16,806,000	16,618,450	17,020,320	18,789,400	14,823,175
Grand total	45,211,000	49,464,950	46,202,420	49,895,500	42,495,375

TABLE IV.

Average yield of wheat per acre, by states:

	Average Bushels Per Acre.				
Winter wheat states—	1906.	1903.	1902.	1901.	1900.
Ohio	20.4	13.7	17.1	15.3	6.0
Michigan	13.1	15.5	17.7	11.1	7.6
Indiana	20.7	10.0	16.0	15.8	5.3
Illinois	19.5	8.4	17.9	17.6	13.0
Missouri	14.8	8.7	19.6	15.9	12.5
Kansas	15.1	14.1	10.4	18.5	17.7
Nebraska	22.0	15.7	20.9	17.1	12.0
Kentucky	....	8.4	9.3	12.1	13.0
Tennessee	....	7.1	7.2	10.8	9.9
New York	....	17.8	16.8	13.1	17.7
New Jersey	....	14.0	16.0	16.8	19.1
Pennsylvania	17.7	15.6	15.8	17.1	13.5
Delaware	....	10.2	16.5	18.5	20.3
Maryland	....	12.5	14.7	17.2	19.5
Virginia	....	8.7	5.7	10.9	11.9
North Carolina	....	5.1	5.3	8.7	9.6
South Carolina	....	6.5	5.6	8.8	9.0
Georgia	....	6.2	6.0	8.2	9.1
Alabama	....	9.1	6.0	8.7	9.5
Mississippi	....	8.0	8.0	8.8	9.6
Texas	....	13.4	9.0	8.9	18.4
Arkansas	....	7.0	9.1	8.8	10.1
West Virginia	....	10.2	7.7	10.9	9.8
California	....	11.2	10.9	13.0	10.3
Oregon	....	18.1	19.9	21.1	13.8
Oklahoma	....	14.9	11.1	16.4	19.0
Indian Territory	....	12.0	12.3	12.2	....
Spring wheat states—					
Minnesota	10.9	13.1	13.9	12.9	10.5
Wisconsin	....	15.6	18.1	16.1	15.5
Iowa	....	12.4	12.8	16.2	15.6
North Dakota	13.0	12.7	15.9	13.1	4.9
South Dakota	13.4	13.8	12.2	12.9	6.9
Colorado	....	26.6	18.0	24.1	22.6
Washington	20.8	20.3	22.2	29.1	23.5
Nevada	....	27.6	27.1	25.1	24.5
Idaho	....	21.1	22.0	21.2	20.8
Montana	....	28.2	26.0	26.5	26.6
New Mexico	....	18.4	17.1	21.5	21.0
Utah	....	22.6	21.2	20.5	20.9
Arizona	....	25.3	18.7	21.8	14.6
Wyoming	....	20.9	23.5	24.5	17.6
Maine	....	25.5	25.3	23.9	19.5
Vermont	....	20.9	18.8	18.7	23.5

From the records of the Department of Agriculture.

TABLE V.

Exports of domestic wheat and flour.

Year Ending June 30.	Wheat. Bushels.	*Flour. Barrels.	Wheat and Flour.
1870	36,584,000	3,463,000	52,169,000
1871	36,285,000	3,653,000	52,747,000
1872	26,423,000	2,514,000	37,738,000
1873	39,204,000	2,562,000	50,733,000
1874	71,040,000	4,094,000	89,463,000
1875	53,047,000	3,958,000	70,861,000
1876	55,073,000	3,935,000	72,782,000
1877	40,325,000	3,343,000	55,372,000
1878	72,405,000	3,946,000	90,165,000
1879	122,354,000	5,629,000	147,687,000
1880	143,200,000	6,016,000	177,000,000
1881	150,564,000	7,652,000	185,000,000
1882	95,267,000	5,073,000	122,598,000
1883	106,385,000	9,422,000	148,785,000
1884	70,348,000	9,152,000	111,534,000
1885	84,653,000	10,648,000	132,570,000
1886	57,759,000	8,179,000	94.565,000
1887	101,972,000	11,522,000	153,820,000
1888	65,789,000	11,963,000	119,626,000
1889	46,414,000	9,375,000	88,600,000
1890	54,387,000	12,231,000	109,430,000
1891	55,132,000	11,344,000	106,181,000
1892	157,280,000	15,196,000	225,665,000
1893	117,121,000	16,620,000	191,912,000
1894	88,415,000	16,859,000	164,283,000
1895	76,102,000	15,269,000	144,812,000
1896	60,650,000	14,621,000	126,443,000
1897	79,562,000	14,569,000	145,124,000
1898	148,231,000	15,350,000	217,306,000
1899	139,432,000	18,485,000	222,618,000
1900	101,950,000	18,699,000	186,096,000
1901	132,060,000	18,651,000	215,990,000
1902	154,856,000	17,759,000	234,772,000
1903	114,181,000	19,716,000	202,906,000
1904	44,159,000	16,730,000	121,000,000
1905	4,391,000	8,757,000	44,000,000
1906	34,793,000	13,871,000	97,000,000
1907	76,556,000	15,500,000	147,000,000

* 4½ bushels of wheat to the barrel.

Pacific Coast exports are shown in the chapter on the Pacific Coast States.

From the records of the Department of Agriculture.

TABLE VI.

Exports of domestic wheat and flour by ports:

Season ending	Flour. Barrels.	Wheat. Bushels.	Flour. Barrels.	Wheat. Bushels.	Flour. Barrels.	Wheat. Bushels.
June 30.	1906-7.	1906-7.	1905-6.	1905-6.	1902-3.	1901-2.
Baltimore	1,731,823	5,026,578	1,485,150	1,609,578	3,168,668	6,847,262
Boston-Charleston	894,286	2,622,505	686,119	297,542	1,061,772	6,429,178
Newport News	819,184	942,359	760,283	160,000	1,618,727	2,954,438
New York	2,995,758	18,679,625	3,160,129	7,504,594	4,538,270	17,403,409
Norfolk-Portsmouth	310,352	.....	327,577	.....	145,479	154,319
Philadelphia	2,174,850	8,391,450	1,611,547	1,201,980	2,704,963	5,361,407
Portland-Falmouth	53,775	1,189,815	35,223	967,767	203,781	3,585,151
Galveston	361,620	14,172,021	343,895	3,816,916	317,497	16,308,842
Mobile	381,571	862	383,938	140	263,929	48,955
New Orleans	618,069	5,496,935	1,062,004	1,521,354	1,111,362	17,836,356
Puget Sound	3,182,614	6,012,732	2,099,601	8,352,911	1,986,206	8,928,909
San Francisco	393,220	413,329	466,540	413,963	872,941	8,549,954
Columbia River	1,239,704	7,198,844	1,013,975	5,658,103	808,604	8,657,932
Chicago	96,821	125,628	27,533	4,800	27,806	2,850,725
Duluth	19,700	1.940,582	30,680	801,030	53,989	1,897,583
Superior	125,504	1,670,625	331,345	655,161	501,976	3,604,811
Other Ports	101,093	2,671,421	45,488	1,827,686	56,960	2,035,221
Total	15,500,044	76,555,911	13,870,997	34,793,525	19,442,930	113,454,542

Amounts taken from the records of the Department of Agriculture.

CHAPTER XXIV.

UNITED STATES (Continued)—THE WEST.

Wheat Area of the Middle West—Should Increase Rather Than Decrease—A Natural Wheat Country—Climate and Rainfall—Minnesota—Average Yield Per Acre—Varieties of Wheat—Experiments to Increase Yield—"Minn. No. 163"—The Future of Wheat Growing in Minnesota—Methods of Wheat Breeding.

ONE-HALF the wheat acreage of the country is in the region called the West, or, the Northwest and the Southwest. That is, Minnesota and the Dakotas, Nebraska, Kansas and Oklahoma. The area under wheat in these states is approximately 23,500,000 acres, and the crop raised is from 275,000,000 to 330,000,000 bushels.

The area of this region,—that is, including the lands under all crops and those not yet cultivated,—is so great that the wheat acreage should never average less than in 1906 and '07. That is to say, even with a tendency toward diversified farming; for there is arable land enough to permanently keep this large acreage in wheat.

Furthermore, such a considerable percentage of the wheat land is carelessly cultivated and there are, on the whole, such possibilities for improvement by means of crop rotation, that the yield per acre might easily be increased.

It seems highly probable, therefore, that the West can be depended upon to grow 300,000,000 bushels of wheat annually, with the possibility that this may in time be increased to 400,000,000 and even to a much greater amount during seasons of particularly favorable conditions.

This great area extending from the Canadian line to southern Oklahoma is the natural wheat field of the country. Soil, climate and topography make it so. And if the average yield per acre in the Northwest has been reduced some three bushels by continuous wheat growing, the properties of the soil can be restored by intelligent crop rotation. Furthermore, the improved subvarieties of wheat that are coming into use will add something more to the average yield.

The climate of the Western wheat states has not only the usual variations with which one meets in traveling from the north to the south, but the additional and gradual changes that obtain between a region of sufficient rainfall and a semi-arid or arid one. Minnesota with its 10,000 small lakes has an average rainfall great enough so that dry farming is of no interest in the state. The climate is influenced by the country of greater rainfall to the east and by the dryer region to the west. The state has seasons of too much moisture and seasons of too little.

The average rainfall gradually becomes less from Minnesota westward through the Dakotas, and the western half of North and South Dakota is in the true semi-arid belt. Eastern North and South Dakota sometimes have seasons of too much moisture.

Nebraska and Kansas also extend, from east to west, from a district of fair average rainfall into the semi-arid to arid belt. Dry farming in the western part of these states and of the Dakotas is bringing large areas under cultivation.

Minnesota, the great spring wheat state, has now been a large wheat producer for forty years; for in 1868 the crop amounted to 15,380,000 bushels. In 1901 and again in 1902 the crop was 80,000,000, the greatest the

state has ever harvested. Wheat growing began in the southeastern part of the state, along the Mississippi and worked westward and then to the northwest. Diversified farming is now general throughout the southern and central parts, and a large acreage is in corn.

The average yield per acre in Minnesota is perhaps 12 bushels, depending upon the number of seasons taken to arrive at the average.

In 1907 the yield was 13 bushels and in 1906, 10.8, but this low yield was due to rains after harvest, which prevented much grain from being stacked. The average yield at harvest was fully 13 bushels, so that the skies rather than the earth were at fault.

The yield in 1905 was 13.3 bushels; in 1904 black rust reduced the yield throughout the Northwest and in Canada. In 1903 it was 13.1; in 1902, 13.9; in 1901, 12.9 and in 1900, 10.5 bushels.

From 1868 to 1877 inclusive, Minnesota dropped below 16 bushels an acre but three times, while for five years the average was 17 to 17.9 bushels. In 1876 nearly half the crop was destroyed by Rocky Mountain locusts; but since that year it has never been seriously damaged by insects of any kind.

A large, permanent wheat acreage in Minnesota is of the greatest importance, first as a source of supply of the much desired spring wheat, and second because of the very large local milling industry. The mills of Minnesota grind nearly 25 per cent. of all the wheat ground in the United States.

Yet over twenty years ago it was seen that the wheat acreage must ultimately be largely reduced unless the farmers could not only get better yields but also a greater percentage of No. 1 wheat.

In 1888 the first systematic search was begun by the Minnesota Experiment Station for better-yielding varieties of wheat than those generally grown in the Northwest. The varieties most generally grown then and now are red fife and blue-stem. The fife is best suited to North Dakota and northern Minnesota, while the blue-stem gives better yields in southern Minnesota and South Dakota than the fife. The latter variety is the wheat that, under favorable conditions, produces the No. 1 hard grade—the type known in the Liverpool market (when from Canada) as "Manitoba". The best quality of blue-stem grades No. 1 northern, and is called in Liverpool "Northern".

The Experiment Station began collecting samples of the varieties of wheat offered for sale by seed houses and seed wheat growers in the United States and in Europe. Several hundred kinds were gathered and tested. But none was found that yielded better than the two varieties already in general use.

However, some sub-varieties of fife and blue-stem were found that yielded rather better than others. As it was found that in Minnesota blue-stem was the more profitable wheat, the farmers were urged to use it, particularly in the southern two-thirds of the state. At the present time there is little fife grown in Minnesota, and that in the extreme northwestern part.

When it became apparent to the Experiment Station that better varieties of spring wheat could not be discovered, although the fife and blue-stem were averaging but 13 to 15 bushels per acre, experiments were begun in wheat breeding. It was hoped that the varieties might be improved and others originated. Red fife and blue-stem and some other varieties were used as the "foundation breeding-stock". Breeding by selection,

and hybridizing, were practiced, while new methods of nursery breeding were devised.

In time, several thousand new varieties of wheat were produced, two of which are likely to more than pay for the long years of patient work at the Minnesota Experiment Station. These two new varieties of spring wheat were christened "Minnesota No. 163" and "169", and are commonly known as "Minn. No. 163" and "Minn. No. 169".

The mother plants of these varieties were grown in 1892, but it required several years, after the varieties had been proved, to grow sufficient seed for distribution to farmers in practicable amounts.

The distribution of No. 163 was begun in 1899, and in five years probably 200,000 acres in the Northwest was seeded to this variety. The No. 169 was not distributed until 1902, or ten years after it had been started from a single seed of blue-stem wheat. The Experiment Station had 1,500 bushels of it that year, and this was sold at $1.50 a bushel, in four-bushel lots, to farmers who were known to be good agriculturists.

Reports were received from many of the farmers who had bought the new seed wheat. Without entering into details, it may be said that the increase in yield of No. 163 over the other varieties on the same farms was 5 to 14 per cent. The average difference in favor of No. 169 over the other varieties grown on the same farms, as reported by 89 farmers, was 18 per cent. The average yield per acre, as reported by the 89 farmers, was 21.5 bushels.

There seem such possibilities in wheat breeding that the experiment stations of the surrounding states, —North and South Dakota, Iowa and Wisconsin, as well

as the Bureau of Plant Industry at Washington,—have entered into extensive co-operation in the breeding of wheat and other crops.

About the year 1903 Professor Hays of the Minnesota Station, wrote as follows:

"The area to be permanently devoted to wheat in these Northwestern states will be determined by the relative value per acre of other crops produced for sale or for feed. The production of live stock is increasing, and with larger areas devoted to grass the acreage devoted to wheat is being reduced in many counties of Minnesota. Whether the grand total number of bushels of wheat raised in the Northwest shall decline, or be increased, depends largely upon its yield of value per acre."

Two of the best new spring wheats averaged at the Experiment Station for eight years 27.4 bushels and 28.4 bushels per acre. These were averages from one-twentieth acre plots under ordinary soil conditions, and were equivalent to 25 bushels in large fields. The soil of the farm at the Station is not above the average of Minnesota soil, and it was fertilized with barn manures and clover, but not more highly than the average field can be under good farm management and crop rotation.

Breeding and proper field management brought about these high average yields of wheat.

The experiment stations and the agricultural colleges, Professor Hays asserts, are rapidly solving the problems of how to rotate crops to get better yields and to make the whole farm more profitable.

As part of the land used at the Minnesota Station is rented and as the land as a whole is no better cleaned of weeds than the average farm can be, by rotation and

reasonably good cultivation, the wheat mentioned in the foregoing was grown under normal conditions, excepting that the small plots "allow the wheat to feed in the border alleys." Ten per cent. is therefore allowed in the yields as compared with a large farm.

It is conservative to say, Professor Hays predicts, that Minnesota should permanently devote 4,000,000 to 5,000,000 acres to wheat. With a yield of 20 bushels per acre, this would mean a crop of 80,000,000 to 100,000,000 bushels; but "eventually its average yield should be pushed to a still higher point."

Experimentation in wheat breeding at the Minnesota Station was begun and the work conducted for a long period by Prof. W. M. Hays, who left the Station in 1901 to go to Washington, D. C., as assistant secretary of agriculture.

In a bulletin on wheat breeding, Professor Hays writes:

The methods of breeding wheat have been reduced to practical plans, comparable to modern systems of manufacturing. After securing the best foundation varieties, a large number of seeds, say 10,000, are selected, preferably from the best heads chosen from the field of a given variety. These seeds are planted in nursery beds, one seed in a hill, four inches apart each way. This gives to each plant the same area of land and the same opportunities as to each other plant. When ripe all the smaller plants are removed, leaving about 500 of those which appear to be the best yielders. The several heads of each of these are placed in a separate packet.

In the seed breeding laboratory in the winter all the heads from each plant are weighed and all plants are discarded but about one hundred of those yielding heaviest. Each of these is shelled and the net weight of the grain secured, and the grades of the grain are de-

termined by inspection. About fifty of the best plants, combining superior yield and grade, are chosen for mother plants.

The second year one hundred seeds are planted in a nursery bed, four by four inches apart from each of these fifty mother plants. When the plots are ripe they are harvested and the exact number of plants in each plot reaching maturity is determined. The weight of the grain is divided by the number of plants and the average yield of the progeny of each of the fifty mother plants is thus secured. One hundred seeds of each of these fifty new nursery varieties are planted the second and third years and at the end of the third year all are discarded, except the five to ten of these nursery stocks or varieties which average the strongest in value per plant for the three years.

These five new varieties are grown for a year in larger plots to get sufficient seed to plant them in field test plots. During the three following years they are grown in plots one by eight rods in area under same field conditions. All the best varieties, and their average yields, milling and baking qualities are compared with the standard wheats. If either of the five new wheat proves more valuable per acre than the wheats which before have been in the lead, it is rapidly increased for distribution.

In the meantime the Minnesota sub-stations, and the experiment stations in adjoining states, test it as a part of the co-operative work of the several stations. The area to which a new wheat is adapted is thus pretty well determined and after increasing the amount to a few thousand bushels, it is sold to several hundred seed wheat growers, that they may grow and sell it in large quantities. These seed growers are chosen by the officers of the Experiment Station and the U. S. Department of Agriculture, as seed co-operators.

CHAPTER XXV.

UNITED STATES (The West—Continued.)

New Development of the Dakotas—North Dakota and the Red River Valley—Oliver Dalrymple and His Big Farm—A 30,000-Acre Wheat Field—Farming Methods—Big Farms of Today—South Dakota—Phenomenal Changes—Advantages Enjoyed by the Farmers—Nebraska.

WHILE Minnesota with its population of over 2,000,000 has its best agricultural lands well under cultivation, and now only requires systematic crop rotation and better average farming methods to have its position well established, the Dakotas are still in the formative period.

After passing through the first-settler stage and several seasons of small crops and the farm-mortgage epoch and the financial depression following 1893, the Dakotas began to "get their second wind" along toward 1900. Then the new development began, and, starting about 1902, a farm-land boom of unprecedented vigor swept over the country. This was a rush for the last of the cheap spring wheat lands. Many thousands of settlers came into the states between 1902 and 1908, and good crops and fair prices brought about a perfect whirlwind of prosperity. Wild lands were broken rapidly and grain raising was carried far to the west,—in North Dakota even to the Montana line, where, a few years ago, it was thought too dry for agriculture.

Of course, diversified farming will follow in the wake of the breaking-plow and the first few seasons of wheat and flax, and it will be many years before the wheat acreage is on an established basis. Still, there is

no reason to expect a smaller average in wheat in the Dakotas during the next ten years than the present area.

North Dakota and South Dakota came into existence in 1891, through the division of the great state of Dakota.

Dakota, the land of the antelope, the buffalo, the Sioux Indian, and of great, unknown prairie lands, became known to the world through the Red River Valley and its big wheat farms and No. 1 hard wheat. And for this, North Dakota will always owe a debt of gratitude to the man whose name will ever remain pre-eminent among the wheat growers of the world—Oliver Dalrymple. Here was a man who turned commercial instincts toward agriculture, and he was a genius in wheat growing just as McCormick was in reaper building. One saw the needs of the reaper; the other saw the possibilities of the machine, and with its aid and a few hands to drive the horses he opened a new empire.

Instead of developing a great estate and peopling it with many servants and living here in a lordly way, Oliver Dalrypmle attacked these wild prairie lands with the commercial spirit dominating. He forcefully wrested the wealth from the unknown and untried fields; and the boat loads of grain that he shipped down the Great Lakes from Duluth advertised his commercial-agricultural victory to the world.

Oliver Dalrymple, now in his seventy-eighth year, is at this time, early in 1908, living in his Summit Avenue home in St. Paul. He was born in Pennsylvania, and is of Scottish ancestry, as the name indicates. Mr. Dalrymple came West in 1855, and the following year settled in Faribault, Minn., where he practised law and engaged in a loan and land business. In 1866, however, he took

up agriculture, in Washington county, southern Minnesota, and seeded 2,500 acres to grain.

It was in 1875 that Mr. Dalrymple turned his attention to Dakota. In that and the following year, the year that the railroad was extended to Bismarck and before there was either railroad station or dwelling between Fargo and Bismarck, he purchased, of the Northern Pacific railroad and of the government, 75,000 acres of land in the Red River Valley. Part of this land he purchased for himself, while he was half owner of the rest with Gen. G. W. Cass, of New York, president of the Northern Pacific; B. P. Cheney, of Boston, and J. L. and E. B. Grandin, of Pennsylvania.

By using in payment Indian scrip and railroad stock at par, the lands cost from 40 cents to $3 an acre.

The Red River Valley lands were of unknown, but very doubtful, agricultural value at that time. The country for 75 miles north of Fargo and for 20 miles or more both east and west of the Red river is low and as level as it is possible for such an area to lie. In the spring the river sometimes widens out and forms a great lake. Mr. Dalrymple told the writer that in the spring of 1876 a large part of his land was under water, and that on a windy day the whitecaps rolled across his future wheat fields high enough to swamp a small boat.

Yet the big farmer had faith in the black, rich soil of the Valley for wheat growing, and he declared it worth $25 an acre for that purpose, whether the country ever became settled or not.

In 1876 he began work on the lands, and broke and put under the plow 6,000 acres a year for five years. This great area, 30,000 acres, was all in wheat, and the farm had buildings at different points and was equipped

with teams and machinery. Mr. Dalrymple then owned three-quarters of the farm, and was the general manager.

Thus originated "Bonanza" or wholesale wheat farming, and this was the beginning of the fame of the Red River Valley. And so famous did the Valley become through its No. 1 hard wheat, that there was for years some uncertainty as to whether Dakota was in the Valley or the Valley in Dakota.

There was an additional 10,000 acres of the Dalrymple-Grandin lands put in wheat, but the 30,000 acres was the greatest area under the same management.

The big farm was operated in divisions of 2,500 acres. A mounted foreman was over each division, and a superintendent was over each six divisions. Every division was equipped with its own buildings, teams and machinery, and was connected with headquarters by telephone. The office at headquarters was connected with the telegraph office at the railroad station.

The lands are so level that much less power is required in plowing and harvesting than in a hilly country. The big farm had 150 gang plows, 70 11-foot gang drills, 150 7-foot self-binding harvesters and 12 extra-large steam threshing outfits.

During the busy season 500 to 600 men were employed, and 600 horses were owned on the farm. The horses were raised on the farm.

The 12 threshers turned out 2,000 to 2,500 bushels of wheat each per day; and during threshing the farm shipped daily two train-loads of wheat to Duluth.

The 12 threshers turned out 2,000 to 2,500 bushels systematically as those of a bank, while all the work was done like that of a military organization.

Mr. Dalrymple gradually sold his lands, until, in

1907, he had but 17,000 acres left. Of this, 12,000 acres is near Casselton, and 5,000 near Hillsboro. Not all is sown to wheat now, for diversified farming or crop rotation is practiced. Barley, oats and rye are now largely grown in the Valley.

The present value of lands in the Red River Valley, all of which, of course, is under cultivation, is $25 and upward, depending on whether the owners care to sell. Of course, as in other localities, there are owners who would not sell unless offered an unreasonable price.

In speaking of the profit of wheat growing, Mr. Dalrymple told the writer that the farmer is sure of a good living, but that the profit is in the natural advance in land values. As he expressed it, agricultural land is worth approximately as many dollars an acre as the number of years the region in which it is has been settled. This rule holds good, in a general way, even though $100 an acre may be paid for a farm in a 50-year-old district.

There are now eleven big grain farms in the Red River Valley in North Dakota, though they are not big when compared with the original Dalrymple farm. Some of these farms have changed hands, but they are still known by their original names. The following table gives the acreage, location and the name of the owner or the name by which the farm is called:

	R. R. Station.	Acres.
Oliver Dalrymple	Casselton	12,000
Oliver Dalrymple	Hillsboro	5,000
C. W. Preston	Blanchard	3,500
C. W. Sutton	Hillsboro	3,000
"Stanford Farm"	Kelso	3,000
"Grandin Farm"	Hillsboro	7,000

"Grandin Farm"	Mayville	6,500
Clark Dalrymple	Kelso and Gardner	5,000
W. A. McKain	Blanchard	2,000
A. D. Read	Blanchard	2,500
"Rand & Brown Farm"	Grandin	4,500

Besides the owners of these big farms there are some who own a large amount of land in scattered areas. For example C. G. Merrill has a farm of 800 acres at Hope, but he has sections here and there in the Valley that bring his total holdings up to 3,000 acres. While at one time he farmed practically all of it, he now rents most of the farms, furnishing seed and taking half the crop.

The owners of these big wheat farms may be called commercial farmers. Some of them went to North Dakota early in the 80's, and few had much money. Now they are wealthy, and they live on their land only from early spring until after the crop has been threshed. Several of these big farmers spend the winters in Minneapolis or St. Paul, and sometimes they travel in the South.

"Going South" in the winter is not, however, confined to the big farmers of the Valley. Many North Dakota and South Dakota farmers now spend a few weeks traveling during the winter, perhaps in Texas, Florida or Cuba.

North Dakota is a competitor for first place among the wheat-growing states, and while the crop of 1906 is given as 77,896,000 bushels by the Department of Agriculture, it is certain that this was an underestimate. The crop was fully 90,000,000 bushels, and the average yield per acre was nearly 15 bushels.

The area in wheat in 1907 was 5,200,000 acres,

which was probably 15 per cent. smaller than it would have been but for the late spring.

A peculiarity of the soil and climate of North Dakota is that when the season is dry enough for the Red River Valley it is likely to be too dry for the western part of the state. The western part never has too much moisture, but the Valley sometimes has.

The crop, acreage and yield per acre of North Dakota are shown in Tables II, III and IV in Chapter XXIII.

In a general way (minus the Red River Valley) agricultural conditions in South Dakota are similar to those of North, with the difference that the state is three degrees of latitude farther south, and that, in the southern part, corn is extensively raised. Yet there is the further difference that agriculture is not being extended so far west in South as in North Dakota.

South Dakota has had more crop failures in the past than it ever will have in the future; for agricultural methods have improved as soil and climate have become better understood.

In the southern part there is a tendency toward the growing of hard winter wheat, the Turkey red of Kansas. This is a better yielding and hardier wheat than blue-stem, and it is probable that as this variety becomes acclimated, it will gradually work farther north.

South Dakota of a few years ago and South Dakota of 1908 are two very different places; and one who has not kept in sympathetic touch with the development of the West cannot realize the difference. An incident will illustrate the point.

One summer recently the writer was traveling in South Dakota to see the crops, and at a small town in

the northern part of the state the local banker volunteered to act as guide for a drive through the surrounding country.

When some five or six miles from town the banker asked the traveler if he would like to know what the wheat market was doing. He replied that it would be of interest, but that he was not aware the banker had a wireless telegraph attachment to his buggy.

"I haven't," smiled the banker, "but this farmhouse can probably connect us"; and he turned his horses toward a substantial-looking frame house surrounded with trees near the roadside. Pulling up at the door, the banker hailed the farmer and asked if he might use his telephone. Permission was cheerfully given, and in a few minutes the banker returned to the buggy and told the traveler the opening price of wheat in Minneapolis and the price at 11 o'clock (it was then 11.30), what the receipts of wheat at Minneapolis and Duluth were, the weather conditions in Kansas, and the overnight fluctuations of the Liverpool market.

"Where did you get it?" the traveler asked in pleased surprise. "Called up the railroad station", replied the banker. "The grain buyers in town get 15-minute quotations from Minneapolis; and as nearly every farmer has a telephone, he can find out the price of wheat at any time of day.

"That is not all", the banker continued, "for when the farmers have a load of grain to sell they call up all the buyers in three or four of the surrounding towns and get the price from each of them. The farmer is a pretty shrewd seller, and as he knows the price in Minneapolis or Duluth, he is in a position to get all his grain is worth."

This is not the picture of a local situation, but of one that is general throughout the West.

Nebraska is making better progress as a winter-wheat state than as a spring-wheat grower; and since 1900 the area in wheat has been approximately 2,500,000 acres each year. Nebraska is the home of dry farming; and, as a result of intelligent farming methods, the crops of the state are as certain as those of any Western state. The average yield per acre for a series of years is high; and considering this in connection with good prices for several seasons, wheat growers should be encouraged to increase their acreage. The quality of the hard winter wheat grown in Nebraska is excellent. The crop, acreage and yield per acre for a series of years are shown in the tables at the close of Chapter XXIII.

CHAPTER XXVI.

UNITED STATES (The West—Concluded).

Kansas—Early Handicaps—Evolution of the Greatest Wheat State—Reliability of Wheat—Increase of Average Yield—Causes—Hard Winter Wheat—Central Kansas—Milling.

KANSAS is not only one of the best agricultural states in the country but one of the most interesting. It is interesting because of its early history, for its present and for what the future may hold in the way of crops.

"The Plains" of early frontier days were largely Kansas; and the stage-coach and the buffalo, the Indian and the "Bad Man" started the reputation of the state somewhat in the wrong direction for the sober future of a placid agriculturist. Then, too, a certain class of early settlers discouraged Kansas as much as Kansas discouraged them; and the stories they told as they "trecked" back toward the places from whence they came were hard for the state to live down. It was unfortunate that so many poor settlers first invaded Kansas, for a few short crops starved them out. People from farther east knew nothing about farming in a country of moderate to light rainfall; and, furthermore, few of the earlier settlers had the means to properly equip a farm where anything but the crudest methods were necessary to bring forth a crop.

Not being understood, Kansas was mistreated. Because it would not do, under the same methods, what Illinois and Indiana with their superabundance of rainfall would do, Kansas was cursed. But it has come into its own at last, and the central part of the state is now

probably the best locality in the world for the intelligent wheat grower.

Although wheat is raised throughout eastern Kansas, the great wheat area begins with the sixth row of counties west, or nearly one-third across the state.

Over 80 per cent. of the crop of the state is grown in somewhat more than the middle one-third of the state east and west, and the full depth north and south. Since 1901 wheat growing has moved westward, and in 1906 two to three times as much wheat was grown in some of the western central counties as in 1901. This is in the semi-arid region; and the western third of Kansas and the eastern part of Colorado are in the land of dry farming and irrigation.

From 1900 to 1907 inclusive Kansas raised good crops with but one exception, that of 1902, when the average yield was but 10.4 bushels. A magnificent crop was raised in 1904, but due to rains at harvest-time a large area was destroyed.

But while there were drouth and floods and green bugs and hot winds during the period from 1900 to 1907, the state harvested from 65,000,000 to 94,000,000 bushels every year but in 1902. This means that in eight consecutive years, and some of the seasons very unfavorable ones, Kansas had one short crop, two moderate ones and five big ones.

As compared with any previous eight years' average, the showing is rather remarkable, and it is one that probably cannot be beaten by any state in the country. But while the record for the eight-year period is in some measure due to more intelligent methods of farming, it is almost entirely due to something else, and there is no element of chance in it. The principal reason for the

higher average yield is found in the predominating variety of wheat grown. Previously to 1900 a large percentage of the wheat grown was of the soft red winter variety, and as far back as 1890 very little hard winter wheat was raised, except in a limited area in the central part.

Since 1899 the bulk of the wheat crop of the state has been hard winter or Turkey red. And of the big crop of 1901, when the total was over 90,000,000 bushels, the amount of soft wheat was well under 10,000,000 bushels; and most of this variety is raised in the southeast corner of the state, though it is scattered throughout the whole of the eastern part.

The hard winter wheat not only yields well but withstands adverse climatic conditions and the attacks of insects that would cause great damage to the soft varieties. In 1904 Kansas had an abnormal rainfall from July 1st to the 10th, and most of the streams overflowed their banks. A great amount of grain was destroyed. The soft wheat that had not been harvested and the late oats were beaten to the ground and whole fields were destroyed outright. While there was great damage to the hard wheat in some counties, it was light compared with what other varieties would have suffered. After the skies cleared, it was several days before the reapers could be got into the fields, and meanwhile the sun had shone with July fierceness upon the dead ripe grain. The writer saw fields that had been ripe for two weeks and had stood all that time in the rains and then were dried by the hot sun; and he followed the reapers to see how badly the wheat would shell out. The estimate then made was that but two per cent. would be lost by shelling in cutting and stacking such wheat.

Again, during the spring and early summer of 1907, —the most unfavorable season the whole West has ever had—after early heat, then drouth and frost, green bugs and more drouth, it was thought half the crop would be lost. Yet the final estimate of the government placed the total yield at over 65,000,000 bushels. With such an outcome after such a season, the wheat-future of Kansas is anything but uncertain. Another such season as that of 1907 may never come, nor is it likely that the floods of 1904 will ever be repeated.

Hard winter wheat was brought into Kansas in 1874 by a party of Mennonites from the Crimea, on the Black Sea. These Russians settled in Marion county, where they planted the hard wheat, and in a few years it had increased to such an extent that the miller at Enterprise, in the adjoining county of Dickinson, refitted his mill to grind it. The miller also encouraged other farmers to grow the Russian wheat. In passing, it may be said that no one seems to know why this wheat is called "Turkey red."

For many years the millers who ground the hard wheat had great difficulty in finding a market for their flour, owing to its dark color. But improved methods of milling the wheat and its real merit finally established its position, and the wheat now has a recognized place in the markets of America and Europe.

In writing of this hard wheat, Mr. F. D. Coburn, secretary of the Kansas Department of Agriculture, says in a bulletin issued by the department:

The best of this wheat is perhaps most largely grown in the central third of the state, from east to west, and in altitude ranging from about 1250 feet in Marion and Sumner counties, to 2100 feet in Edwards, an average close to or slightly below 1600 feet. The four largest wheat-

producing counties, Sumner, Barton, Rice and McPherson, have an altitude averaging about 1250, 1900, 1700 and 1450 feet respectively. These wheats do not retain their peculiar characteristics so well when grown in the extreme eastern or southeastern counties, showing a tendency to assume more the qualities of the soft sorts; it is claimed by many intelligent observers that this is true, but to a much less extent, elsewhere, wherever they are grown in Kansas.

This has for some time suggested the desirability of procuring fresh seed from time to time from its original home in Russia, and in 1901, through the concerted efforts of the Kansas grain and milling interests, an importation of 15,000 bushels of choice seed was made direct from southern Russia, and distributed at cost in time for the fall sowing. Farmers are rapidly learning that profit comes from sowing the best obtainable, and that sowing the same wheat continually on the same ground is not always satisfactory.

Kansas is an important milling state, and had, in 1900, as given by the census report, 260 mills, which ground in that year 23,400,000 bushels of wheat.

In addition to the mills of the state, the big mills of Kansas City, Mo., were the outgrowth of hard winter wheat. Kansas City has eight mills with a total daily capacity of 13,800 barrels. They actually produce 2,000,000 barrels of flour yearly. Kansas City is also an elevator center.

CHAPTER XXVII.

UNITED STATES (Concluded)—PACIFIC COAST STATES.

Acreage and Crops by States—Washington—Wheat Area—Palouse Country—Big Bend—Walla Walla District—Climate, Varieties of Wheat, and the Yield—Land Values—Oregon—Area—Land Values—Idaho—Wheat Lands, Irrigation and Diversified Farming—Wheat Handling in Coast States—Export Trade—Flour Mills—Oriental Trade—Exports From Puget Sound—From the Columbia River—From California.

It is probable that in the crop season of 1906-07 and 1907-08 the Pacific coast has reached its limit as an exporter of wheat and flour. That is, unless California should have a 35,000,000-bushel crop the same season that Washington and Oregon have full crops. This is not likely, however, for since 1900 the wheat acreage in California has decreased 50 per cent. Washington and Idaho meanwhile increased their area in wheat, but the Oregon acreage shows a decided decrease. Consumption of wheat is increasing rapidly in the Pacific coast states, and diversified farming and crop rotation will have a tendency to prevent a corresponding increase in the wheat acreage. Washington still has some new lands that will gradually be devoted to wheat; but, as an offset in part, at least, to this increase, some of the present lands in wheat will be turned to other crops.

On the whole, therefore, it is probable that the tendency will soon be toward decreasing exports of wheat from the Pacific coast rather than toward any increase.

The acreage in wheat and the crops for a series of years in the Pacific Coast states are shown in the following tables:

	1907.	1906.	1900.
	Acres.	Acres.	Acres.
Washington	1,350,000	1,205,000	1,068,000
Oregon	651,000	712,000	1,173,000
Idaho	342,000	337,000	149,000
California	1,368,000	1,572,000	2,771,000

Wheat crop of the Pacific Coast:

	Washington.	Oregon.	Idaho.	California.
	Bushels.	Bushels.	Bushels.	Bushels.
1907	35,045,000	15,265,000	8,640,000	20,520,000
1906	25,075,000	14,214,000	8,231,000	26,883,000
1905	32,516,000	13,382,000	10,341,000	17,542,000
1904	32,141,000	14,050,000	6,832,000	17,475,000
1903	20,000,000	12,439,000	5,128,000	20,926,000
1902	23,672,000	15,513,000	6,022,000	22,374,000
1901	34,519,000	17,158,000	6,241,000	34,743,000
1900	25,097,000	16,198,000	3,105,000	28,544,000
1899	21,710,000	21,949,000	3,440,000	33,744,000
1898	23,453,000	24,708,000	4,197,000	12,214,000
1897	20,124,000	18,155,000	2,708,000	32,394,000

The export shipments are given at the close of this chapter.

The district of the Pacific Northwest known as the Inland Empire embraces nearly all the wheat area of Washington, Idaho and Oregon, with Spokane as the commercial metropolis located almost in its center, geographically. For the purpose of definiteness and accuracy, these states will be treated separately.

The leading wheat-growing state of the Pacific coast is Washington, twelve counties of which, east of the Cascade Mountains, contain approximately 2,000,000 acres of wheat lands under cultivation (part in summer fallow each year), yielding an average for 1907 of 21.5 bushels of spring wheat and 24.5 of winter or "fall" wheat.

The area may be roughly divided into four districts: (1) The Palouse country to the south of Spokane, as far as the Snake river, and including portions of Spokane, Whitman, Adams and Franklin counties and lapping over into western Idaho. (2) The "Big Bend", com-

prising the land west and northwest of Spokane and included within the Big Bend of the Columbia river. (3) To the west of the first two and traversed from north to south by the Columbia river is a large area, until recently classed as semi-arid, which is now being very generally cultivated and with good results. (4) The Walla Walla district embraces the country south of the Snake river and extends into Oregon.

The Palouse country is a rolling prairie of an elevation above sea level varying from 1500 to 3000 feet. The climate of this region is mild, with light snow fall in winter, but with rarely zero weather. There is no settled practice among wheat growers, either as regards season of planting or variety of grains grown; thus one section runs to spring wheat while in an adjoining district winter wheat predominates; and this is true to a large extent of the entire state. Blue-stem and club are the principal spring varieties, while fife, Turkey red, or red Russian are the favorite winter wheats.

Throughout the district about 30 to 40 per cent. of the land is summer-fallowed each year, though some attention is now being paid to crop rotation, and good crops of all the common farm products are grown.

The average yield per acre of land well farmed runs from 20 to 35 bushels of spring, and 25 to 45 bushels of winter wheat.

This district claims credit for the largest crop of wheat ever grown in a single field. It was on the farm of Mr. R. C. McCroskey, of Garfield, from which was threshed an average of 46 bushels per acre from a field of 1,000 acres, in 1907.

While general farming is not common, all fruits do well and many farmers have profitable orchards. Farms

in the Palouse country vary in size from 160 to 480 acres though there are many, especially toward the western part, of 1,000 to 5,000 acres.

Farming methods are modern. The combined harvester and thresher are largely employed, usually drawn by 32 horses, though in some sections traction engines are used. These machines cut, thresh, clean and sack 30 to 40 acres per day; and, it is asserted, save two to four sacks of wheat more per acre than any other method. Binders are not employed. The cost of raising wheat and delivering to local markets is 26 to 40 cents per bushel, depending upon the distance from market and the methods of farming employed.

The Big Bend country is less rolling than the Palouse, as a rule, with slightly less rainfall. Farms in this district range in size from 160 to 640 acres, with a few of 5,000 to 10,000 acres. Here 30 to 50 per cent. of the land is summer-fallowed and no effort has been made toward diversifying or rotation of crops. Fruit and vegetables do well and it is generally believed that corn fodder will thrive; but, like the entire Inland Empire, wheat growing has been so profitable that no attention is paid to other crops. Only 10 to 30 per cent. of winter wheat is grown, as it is regarded as less reliable. The yield per acre is 20 to 40 bushels throughout the northern and eastern portions of the Big Bend, while toward the southwest, bordering on the so-called semi-arid district, it is somewhat less. Blue-stem is the chief grain grown here.

Practically all the arable lands are under cultivation, and prices range from $20 to $30 per acre for lands, without buildings, while with buildings, wells, etc., the prices

run to $35 or $40. The climate is somewhat dryer, with temperatures about the same as in the Palouse.

The cost of raising wheat and delivering to the railroads or to steamboat landings on the Columbia river varies from 24 to 40 cents per bushel. Little attention has been paid to road building and the cost of delivering grain will be materially reduced when this subject has received due attention.

The semi-arid belt, west of the Palouse and southwest of the Big Bend, including portions of Douglas, Kittitas, Yakima, Franklin, Walla Walla, Benton and Klickitat counties, was, until very recently regarded as of no value save for grazing, except in those favored spots where water could be had for irrigation. Now, however, as the experiment has been tried it is found that paying crops can be raised and a large acreage of winter wheat land is being added to the state's agricultural area. It is too soon to say what the yield will be, but an average for 1907 of 14 bushels of spring and 18 bushels of winter wheat is an indication of what may be expected. An experiment with the Campbell method of dry farming is being made near Mesa, in Franklin county.

No effort has been made at crop rotation or diversified farming. Yet vegetables and corn have proved successful in a few instances, while in the irrigated districts fruits of all kinds grow abundantly. About half the land is summer-fallowed each year and the farms vary in size from 160 acres to three or four sections. Improved lands are worth $15 to $30 per acre, and wild or "raw" lands $5 to $15, depending upon location, nature of the ground and other conditions.

This district has an elevation above sea level varying from about 500, along the Columbia, to 1,500 feet a few

miles back from the river. The winters are mild, with light snowfall, while the summers are hot, but with cool nights. The farmers in many portions of this district, living within a few miles of the Columbia river, secure their fuel from the river, which each year piles great quantities of driftwood upon the bars.

Walla Walla, in southern Washington, is the center of a great area of wheat land extending south into Oregon and embracing some of the most productive lands of the Inland Empire. About 55 to 60 per cent. of the wheat grown in this region is sown in the fall. The average yield is nearly 25 bushels per acre where the best methods are followed, though crops of 40 to 60 bushels are not regarded as phenomenal. The varieties grown are blue-stem, little club, Turkey red and winter fife.

Probably half the land in this district is summer-fallowed. The farms vary in size from a few acres up to several thousands.

The cost of growing wheat and delivering it to market varies from 25 to 40 cents. Practically all the available lands are under cultivation, and values range from $15 to $75 per acre, depending on the nature and extent of improvements. Diversified farming is not practiced, though many farmers have small orchards; and, where water is to be had for irrigation, the finest of fruits are grown.

The recognized wheat area of Oregon comprises about 700,000 acres in Umatilla, Morrow, Gilliam, Wasco and Wheeler counties, in the northern part of the state, while a diminishing area in the Willamette valley south of Portland still includes about 100,000 acres of land that produces good crops of wheat. The latter is the

only district in the Pacific Northwest where fertilizers are used.

Twenty miles south of Walla Walla, in Oregon, is the Umatilla Indian reservation, in which there is about 24,000 acres of fine wheat land, most of which is leased by the Indians to white settlers for a cash rental of $3 to $9 per acre for a period of two years. The Indians reserve the right to harvest the fields and pasture their stock on the stubble. Toward the east near the Blue Mountains, where the rainfall is heaviest, the country resembles the Palouse district of Washington, and the yield is about the same. Farther west, in the dryer area, the yield is like that in the corresponding district of Washington. Sixty per cent. of the land is under cultivation. One-half the wheat land is summer-fallowed and there is very little diversified farming. Land values range from $15 to $75 per acre.

In the southern and southeastern portions of the state, in Harney, Malheur, Wheeler and (western) Grant counties there is a very large area of sage brush and bunch-grass land that will, in all probability, develop into a great wheat-growing district. This is an elevated plateau varying from 1,500 to 4,000 feet above sea level. The winters are colder than in eastern Washington, the mercury often registering 8° to 20° below zero during January, with perhaps eighteen inches of snow covering the ground. Lack of railroads and navigable streams has retarded the development of this section; but the soil is there and possibly one-third the area of Malheur and Harney counties will grow wheat as well as the Palouse and the Big Bend of Washington, while fruit does well at the lower elevations in the valleys. This is probably the largest area of undeveloped wheat land in the United

States. Improved lands are worth $20 to $50 per acre, while wild lands sell for $6 to $10.

Idaho contains, in two general districts, about half a million acres of wheat land under cultivation. The western or winter wheat district, embracing portions of Latah, Nez Perce, and Idaho counties, with Lewiston as the commercial center, has about 350,000 acres now in wheat. The average yield here is large,—25 to 30 bushels per acre, with individual yields much higher. All crops do well here and the finest of fruits, including grapes, may be grown where water for irrigation is available. In Latah county corn grows well and is replacing summer-fallowing to a large extent. The climate is similar to that of the Palouse country of Washington, the snowfall being light and zero weather unusual.

The spring wheat counties of Fremont, Bingham, Oneida, Twin Falls and Lincoln, in the southeastern part of the state, are reached by the Union Pacific railway. The area in wheat is about 150,000 acres, yielding an average of 18 to 20 bushels per acre and this area will doubtless be materially increased as the bench lands are brought under the plow. The elevation is 2,500 to 4,000 feet above sea level, and the winters are somewhat colder than in the western counties, though the snowfall is light. In this district irrigation projects now under way will water about 2,500,000 acres of good arable land, of which one-half is already under cultivation. While enormous yields of irrigated wheat are grown (as high as 84.5 bushels of wheat to the acre and 110 of oats) it is probable that this entire area will be given over to dairying, fruit growing and general farming. The size of the farms will be reduced to a few acres, as twenty acres will support a family. Sugar

beets are grown successfully here as in the Spokane region of Washington and Idaho. Wild lands under the various ditches are sold for $35 to $50 per acre, while improved lands near the towns are held as high as $100 to $200 per acre. The wild lands above the ditches are held at $15 to $30 per acre.

GRAIN HANDLING.

Of great importance to the entire Inland Empire is the question of improving the navigation of the Columbia and Snake rivers. When boats are able to run from Kettle Falls, on the Columbia, in northeastern Washington, and Lewiston, on the Snake, to Portland, there should be a material reduction in the freight rates on grain and other farm products.

For miles these streams flow through deep canyons, uniting near Ainsworth, Washington; and at several points the grain is lowered to boat landings from elevations of 1,000 to 2,000 feet, by means of aerial tramways, at a cost of 1½ to 3 cents per bushel.

The question of handling wheat in bulk, instead of in sacks, as at present, is now being agitated, with opinion about evenly divided. The exporters at seaports are opposed to the innovation, as it would necessitate sacking of the grain at their elevators before loading on shipboard; for the vessels now in the grain service are not equipped to handle grain in bulk.

An easterner is struck with the absence of elevators throughout the Inland Empire. In their place warehouses are used, and even open platforms on which the grain is piled in sacks to await shipment. As a protec-

tion against possible rain, tarpaulins or temporary board roofs are sometimes employed.

THE EXPORT TRADE.

Portland, the oldest city of importance in the Pacific Northwest, has been exporting wheat for forty years. The first small shipment for export was made in 1868, and the entire surplus crop of eastern Washington, Oregon and Idaho for the year 1873 was exported in two vessels of a combined capacity of 81,713 bushels. The same territory now produces annually 50,000,000 bushels, while the Willamette Valley south of Portland has fallen from an average of eight or ten million bushels to about one-fourth that amount. Diversified farming,—chiefly dairying, stock and fruit raising,—has replaced wheat growing to that extent.

Today Portland has a line of large steamers leaving every twenty days for the Orient. Tacoma has regular service of thirteen vessels a year by one line, while a Japanese line sends two vessels a month to Seattle, and another line of steamers is operated from Tacoma and Seattle to Japan and Chinese ports and Manila, P. I.

The first flour mill was built at Astoria in 1811 by one Cannon, a blacksmith with the Astoria expedition; and other mills were in operation in 1836. The chief milling centers are Portland, Tacoma, Seattle and Spokane, where the large mills are located, though many small mills are distributed throughout the grain belts.

In 1906 there were in operation in the three states 241 flour mills with a combined capacity of 40,620 barrels of flour per day, besides a large output of cereal

foods and barley products. These mills were distributed as follows:

	Mills.	Bbls. per day.
Oregon	127	19,150
Washington	66	18,075
Idaho	47	3,395

A feature of the Oriental trade is the tendency toward an increase in shipments of wheat at the expense of flour, and the milling interests will soon have to face the problem of reciprocity with Japan if they are to hold the flour trade. A discriminative tariff in favor of Japanese millers threatens the export flour trade and appears as the only cloud on an otherwise bright horizon.

However, the time will come when the increased population resulting from the growth of diversified farming, the development of the enormous mineral wealth of British Columbia, Washington, Idaho and Oregon and the increase of manufactures will create such a large home market that there will be little need to look for enlarged foreign markets.

Exports of wheat and flour from Washington and Oregon for the season of 1906-7, are shown in the table that follows, flour reduced to wheat, 4½ bus. to the barrel. (The export figures in the tables that follow were taken from the Commercial Review, of Portland):

	Bushels.
From the Columbia river	14,680,000
From Puget Sound	20,610,000
Total	35,290,000

There was in addition to this 57,175 barrels of

Canadian flour exported to the Orient.

Exports of wheat and flour from Puget Sound for the last eleven seasons:

	Wheat, Bus.	Fl., Bbls.	Vessels.
1906-7	6,187,337	3,205,056	35
1905-6	12,065,295	2,129,478	66
1904-5	2,233,900	1,741,399	11
1903-4	2,468,583	1,922,616	11
1902-3	8,512,381	1,858,912	80
1901-2	14,132,170	1,394,700	122
1900-1	8,309,290	1,073,200	69
1899-0	3,861,668	983,840	35
1898-9	6,527,221	764,377	50
1897-8	8,179,421	644,693	71

Exports of wheat and flour from the Columbia river for the last eleven years:

	Wheat, Bus.	Fl., Bbls.	Vessels.
1906-7	8,172,200	1,446,261	52
1905-6	10,397,300	1,214,900	40
1904-5	3,652,000	995,300	20
1903-4	4,614,300	1,085,100	39
1902-3	9,656,600	965,300	92
1901-2	12,766,900	823,850	123
1900-1	13,227,100	1,005,400	128
1899-0	9,616,300	1,093,650	98
1898-9	10,896,500	1,046,800	106
1897-8	14,817,600	907,900	136

The average size of wheat cargoes has increased materially in the last five years, and it has practically doubled in the last twenty-five years. The average cargo carried by the ten largest vessels loading at Portland since 1872 is shown in the following table:

	Bushels.
1907	226,620
1902	165,309
1892	114,393
1882	75,390
1872	33,615

Discussing the charge for carrying wheat to Europe, E. W. Wright says in the Portland Oregonian:

"In the days of small ships and a poor channel in the river, shipowners were paid 60 to 105 shillings a ton for carrying wheat to Europe; and 10 or 15 years ago 40 shillings was considered a normal rate. In 1907, in spite of a temporary spurt caused by a booming wheat market in England and very heavy offerings in the Pacific Northwest, the average rate to Europe was only about 30 shillings and some vessels were secured at less than 25 shillings."

California has been a small exporter since 1903, and the export shipments for the season of 1906-7 were the smallest in recent years. They amounted to but 247,900 bushels of wheat and 379,390 barrels of flour. For the season of 1901-2 they were 9,672,000 bushels of wheat and 1,179,900 barrels of flour. This was the largest since 1897-8, when they amounted to 9,992,000 bushels of wheat and 823,000 barrels of flour.

CHAPTER XXVIII.

JAPAN—CHINA.

JAPAN raises approximately 20,000,000 bushels of wheat annually, on 1,100,000 acres of land, and the average yield per acre is close to 18 bushels. From 1891, the earliest official records, to 1900 there was very little change in the relative acreage of the different crops. The total area of Japan is 94,500,000 acres, and of this but 15,500,000 is arable land.

But Japan is of interest mainly because of its imports of American flour and wheat, and this is of importance to the Pacific Coast states only.

The following tables show the amount of wheat and flour imported during the calendar years 1904, '05 and '06, and the amounts from each of the exporting countries:

	1906. Wheat, Bu.	1906. Flour, Bbls.	1906. Total Bu.
United States	661,000	1,040,000	5,341,000
Canada	.....	21,000	94,500
Australia	37,000	11,000	86,500
India	8,000	.....	8,000
Others	81,000	1,500	87,700
Total	787,000	1,073,500	5,617,700

	1905. Wheat, Bu.	1905. Flour, Bbls.	1905. Total Bu.
United States	1,427,000	1,206,000	7,854,000
Canada	.....	12,000	54,000
Australia	655,000	25,000	767,500
India	183,000	.....	183,000
Others	13,000	500	15,300
Total	2,278,000	1,243,500	8,873,800

	1904. Wheat, Bu.	1904. Flour, Bbls.	1904. Total Bu.
United States	485,000	1,254,000	6,018,000
Canada	.....	28,000	126,000
Australia	345,000	10,000	390,000
India	44,000	.....	44,000
Others	11,000	500	13,300
Total	885,000	1,292,500	6,591,300

Compiled from "Annual Returns of Foreign Trade of Japan, 1906," Bureau of Statistics, Department of Commerce and Labor.

Japan was a very small importer of wheat and flour as far back as 1870; but the country was also an exporter until 1898. In 1878, according to the "Returns of Foreign Trade," the wheat exports amounted to 1,022,000 bushels, and in 1883 to 860,000. In 1898 the flour exports were 15,761 sacks of 280 pounds, and no exports of either flour or wheat are recorded since then.

The first year of important flour imports was 1896, when 162,877 barrels was imported. The wheat imports were small up to 1904.

Since 1897 the flour imports increased rapidly to 1904, when the maximum was reached. The official figures for 1907 are not yet available.

In 1885 a modern roller mill was built in Japan by an American builder, but it was a small affair of only 125 barrels daily capacity. Japan now has some half dozen modern mills, mostly erected by American mill builders. One is of 400 barrels daily capacity, and another of 800 barrels. A heavy handicap to the milling business is the absence of a market for millfeed (bran and shorts). It was suggested in 1907 that bran be used as a fertilizer, but whether this has been done, the writer is unable to say.

The following is from a letter (written early in 1908) by an American millwright who was sent to Japan to superintend the building of an 800-barrel mill; and it

is given a place here because of the light it throws on flour milling in that country:

"The Nipon Company has just started a new 600-barrel mill at Kobe. The interpreter tells me that the manager is in no hurry to start this new mill, as they are losing money on what flour they are already turning out.

"The manager seems not to worry about my doing nothing. He wants me to teach his millers how to run the mill, which I think will be a job. No one can teach these Japs. They are stubborn and don't like foreigners. They will not employ a head miller; they will run the mill themselves some way. They are not as good help as the peons of South America.

"There will probably be employed in and around this plant 150 men. They carry the wheat in on their backs from boats in canal about 500 feet, and the flour is handled in the same way.

"I think the cost of manufacturing flour is more in this country than in the States. The offal sells for about $10 per ton. I think the mill owners will find milling in Japan an unprofitable business, unless conditions change. They are importing wheat from Seattle for their present needs. The manager says there are too many mills in Japan. There is a project under way to consolidate all the mills in Japan.

"The mill manager wants me to go to Kobe and show them how to operate that mill. I have put him off until after I start this one. I saw their sample of flour and think they are making about one-third of it into low grade. These two mills here are doing poor work, from what I have seen of their samples. The owners won't let me go into their mills."

CHINA.

Hong Kong, having an area of 30 square miles and a population of 300,000, is a considerable importer of flour. In 1898 the imports were 940,000 barrels; in 1899, 1,221,000; in 1900, 1,410,500; in 1901, 1,322,500, and in 1902, 1,398,900 barrels.

The imports of flour by China are unimportant, and the possibility of China becoming a great wheat-eating country is too visionary to be given serious consideration.

China has several modern flour mills, all built within the last eight years, and an American mill-building firm received a contract in 1907 for a mill of 1,500 barrels daily capacity to be erected in Hong Kong. This is a good-sized mill even in America.

Manchuria gives promise of becoming an important wheat-growing country and a country of mills as well. There are already several modern mills there.

CHAPTER XXIX.

POSSIBILITY OF INCREASING WORLD'S WHEAT CROP.

Scientists and Their Predictions—World's Crop 1897 to 1907—Elasticity of World's Supply and Demand—How Supply Will Be Increased—A Five Billion Bushel Crop—New Lands in Western Canada, Argentina, Siberia, Manchuria—Irrigable Lands—Irrigation Projects—Extent of New Area—Dry Farming—Immense Possibilities—Eastern Colorado—Utah and Nevada—Soil Exhaustion—Continuous Wheat Cropping—Increased Yield Per Acre—Commercial Fertilizers—Experiments in Minnesota—Crop Rotation—Exhausted Soil Renewed—A Practical Solution of Problem—Results of Experiments—Better Farming Methods—Pasturing Winter Wheat Fields—Better-Yielding Seed—Durum Wheat for Semi-Arid Regions—Will the United States Become an Importer of Wheat?

In view of the rapidly increasing number of bread-eaters in the world and the growing per capita consumption in some countries, the possibility of a further increase in the world's production of wheat is a matter of great importance.

Some ten years ago Sir William Crookes, owing to his high standing as a scientist, was able to startle Great Britain by predicting (backing his prediction with some theoretical computations) that the world's demand for wheat would, in a few years, overtake the supply: in fact, that bread-hunger threatened the wheat-eating people.

In June of 1907 another scientist, Prof. Silvanus P. Thompson, although he wrote "D. Sc., F. R. S., B. A., London, M. D., Koningsberg," after his name, failed to startle anybody by an article, "When Wheat Fails," which was printed in Harper's Weekly.

Professor Thompson said that "it is possible to estimate the total available acreage of the world, and this, including inaccessible regions such as Siberia, may be set down at not much more than 240,000,000 acres. At the present average yield of 12½ bushels of wheat per acre," he wrote, "this would furnish an annual crop of 3,000,000,000 bushels; and as each wheat-eater consumes on the average 4½ bushels per annum (in which estimate .6 bu. needed for seed is included), the whole available area will suffice to furnish wheat for a total population of 666,000,000 people."

This number of bread-eaters had not been reached in 1907, but the professor estimated that the number was 585,000,000 and that the larger number would be reached about the close of 1910.

The complacency with which scientists sometimes break into print and theoretically arrive at conclusions or settle great questions about which they know nothing, is truly charming. Now the theoretical reasoning of Professor Thompson is perfect, but something was wrong with his premises, hence his conclusion is several years and several hundred million bushels out of joint.

The professor plainly stated that the available wheat acreage in the world "may be set down at not much more than 240,000,000 acres," and that "at the present average yield of 12½ bushels this would furnish an annual crop of 3,000,000,000 bushels."

This is rather startling, coming from a scientist with so many letters after his name, when it is commonly known in the grain trade that the world has averaged 3,228,000,000 bushels annually since 1901. The crop of 1905 was 3,249,700,000 and that of 1906, 3,400,000,000 bushels, while 1907 fell off to only 3,060,000,000.

But it does not require a scientist to tell us that if the consumption of wheat increases faster than the production, there will be a shortage of wheat some day; though it may take a scientist to prove that such a situation is imminent.

During the last eleven years or since 1897 the increase in the world's crop and in the consumption of wheat has been enormous. The following table shows the world's wheat production for that period:

	Bushels.
1907	3,062,000,000
1906	3,414,000,000
1905	3,249,700,000
1904	3,134,000,000
1903	3,238,000,000
1902	3,087,000,000
1901	2,822,000,000
1900	2,583,000,000
1899	2,697,000,000
1898	2,894,000,000
1897	2,226,000,000

Considering the figures for 1906 and '07, in connection with the known conditions of supply and demand during those years and the first part of 1908, two things become apparent. One is that, given an unusually big crop (and the consequent low prices), consumption is greater than with a smaller crop and higher prices; but perhaps not so much as a result of actually using the wheat as human food as due to wastefulness both about the kitchen and in handling the grain on the farm; also, more is fed to live stock. More wheat is also held in farmers' bins and carried over to the next season. The

other impression caused by the crops of 1906 and '07 is that not only does the high price caused by a short crop result in economy in the kitchen and on the farm, which in part offsets the shortage, but that less wheat is actually eaten. The high price incident to a short crop results in a decreased use of wheat as food.

Thus it is that a fluctuation of two or three hundred million bushels in the world's wheat crop causes no inconvenience to the bread-eating people as a whole. The world's demand for wheat is just as elastic as the supply.

HOW THE WORLD'S CROP WILL BE INCREASED.

That the world's supply of wheat can be largely increased,—in fact, brought up to 5,000,000,000 or possibly 6,000,000,000 bushels,—there can be no question. Whether the increase will keep pace with the demand (or what the demand would be at low prices) introduces another proposition. Yet it seems reasonably certain that the crop will keep pace with the demand, such as it is, for it will be regulated by the price. That is, at $1 a bushel in Chicago and a corresponding price in Liverpool (should this basis ever be permanently established) the growing of wheat would no doubt be so stimulated that the supply would be sufficient.

Any increase in the world's supply of wheat must come from the following sources:

New lands, "natural"—
- By irrigation.
- By dry farming.

Increased yield per acre—
- By fertilization.
- By crop rotation.
- By better farming methods.
- By better-yielding seed.

Considering the "natural" new lands, so called to distinguish them from new area than can be used only by means of irrigation or dry farming, we find three great areas, and probably a fourth. The nearest at hand and the one that gives most promise of rapid development is Western Canada. There is a vast extent of wild land in that country that could at once be broken and seeded to grain. All that it awaits is the settler. The country is described in Chapter XXI.

Argentina is the next country of great possibilities, but it will be slower in developing than Canada. Still, the area is there, and it will help to put to confusion the scientists who arrive at theoretical conclusions. In Chapter XIX mention is made of the great area of unoccupied lands in Argentina. The following prediction was ventured by Senor Tidblom of Argentina:

"The wheat area will undoubtedly extend toward the south, disappearing from the north and center of Cordoba, Santa Fe, and Entre Rios, and definitely settling in the extreme south of those provinces, in all of the province of Buenos Aires, especially in the north, west, south, and southwest; in all the territory of the Pampa; in the extreme south of the province of San Luis, and in the territories of Neuquen, Chubut, Rio Negro, Santa Cruz, and Tierra del Fuego. It is absolutely impossible to predict its growth, but there is more than 80,000,000 acres in the Republic that could be immediately devoted to successful wheat farming if we had the farmers to do it."

Mr. William Goodwin, F. R. G. S., in his account of wheat growing in Argentina, published in Liverpool in 1895, said:

"If one-half the supposed suitable land were to pro-

duce a crop of 10 bushels of wheat per acre, the result would be 1,237,815,000 bushels, which is about half of the estimated wheat crop of the world in 1894; the Argentine Republic may well be called a country of great possibilities."

Siberia will, without doubt, become a great wheat-growing country; though how great and how soon no one can tell. About all that can be said is that there is a gradual increase in the acreage under cultivation, and that there is sufficient arable land to grow, when settlers can be found to cultivate it, another billion bushels of wheat.

While the estimates of the area of arable lands in Siberia have gradually been reduced from time to time, authorities have now agreed upon 425,000 to 450,000 square miles as approximately correct. This is exclusive of the steppes of Turkestan. The area is equal to that of the Dakotas, Minnesota, Nebraska, Kansas and Missouri; and only a small part of this vast extent of arable lands is under cultivation.

Of 450,000 square miles, or 288,000,000 acres, that admits of colonization and agriculture in Siberia, less than 11,000,000 is actually planted. Thus wrote Mr. Rubinow, economic expert, division of foreign markets, United States Department of Agriculture, in 1905. That writer continues:

"With the semi-barbarous system of agriculture that is prevalent in Siberia, only a small part of the land occupied is planted each year, so that the area under agricultural occupation may be estimated as three or four times larger than the area planted, i. e., 30,000,000 to 40,000,000 acres, or 10 to 14 per cent. of the cultivable area.

"It still remains true that a very small part of available territory in Siberia has been settled as yet, and the farther east one goes the smaller does that part become. Thus in western Siberia, out of 80,000,000 acres, 7,500,000, or 9 per cent., is under crops; in middle Siberia, 2,186,000 acres out of 73,600,000, or 2.5 per cent.; in Transbaikalia, a little over 1.1 per cent. (750,000 out of 64,000,000 acres); in Amur, 0.6 per cent.; and in the Ussuri-Littoral region only 0.3 per cent.

"It must be acknowledged, therefore, that sufficient land is to be found in Siberia for an enormous extension of agriculture, which will depend only upon the supply of labor, i. e., upon the growth of population."

Manchuria is the fourth country that may give to the world a large area of new wheat lands. While the area of arable lands is not as yet known, travelers agree that it is very large; and it is known that the climate and soil are suitable for wheat growing. Whether China may develop as a wheat-eater as rapidly as Manchuria does as a grower, is, of course, a matter for the future to unfold.

IRRIGATION AND IRRIGABLE LANDS.

There are no indications that irrigation in any part of the world excepting in the United States, Western Canada and India will have an influence on the wheat acreage: and in India, apparently, irrigation is tending toward assuring a crop for the lands under cultivation rather than to add new areas to agriculture. While new irrigation projects in Egypt may make history for the cotton world, they will not affect wheat.

In fact, irrigation, valuable to the small farmer and fruit grower, will give but a small new acreage, and give

that slowly, to wheat growing. Even if all the irrigable lands in the United States that will be watered from work now being done through the reclamation service, were seeded to wheat, the crop would hardly be a factor in the total yield of the country. Furthermore, all the projects approved and in process of construction, and those that have been investigated and found feasible would add but 5,367,000 acres to the land under cultivation. If this total area were available (it may not be for fifty years) and were all under wheat, it would then really be a factor of importance. But of course only a small percentage of land under irrigation, even in a wheat region, is given up to wheat; one-fifth is probably a large estimate. Only 1,587,000 acres of new land will be added to agriculture in the United States through irrigation as a result of the work recently done and under way.

In an article on the reclamation of the arid West by the Federal Government, in The American Waterways, published by the American Academy of Political and Social Science, Arthur P. Davis, chief engineer of the reclamation service, says:

"The total amount expended from the Reclamation fund to December 31st, 1907, is $33,300,000. The amount available for expenditure during the calendar year of 1908 is approximately $7,000,000." Mr. Davis, after a brief description of the work done and under way, gives a list of the projects approved and in process of construction, with the irrigable acreage that will be placed under cultivation in the next few years, as follows:

Project.	Irrigable acreage.	Estimated cost.
Salt River, Arizona	200,000	$5,300,000
Yuma, California-Arizona	100,000	4,500,000
Orland, California	30,000	1,500,000
Uncompahgre, Colorado	140,000	6,200,000
Grand River, Colorado	50,000	2,500,000
Minidoka, Idaho	80,000	2,000,000
Payette-Boise, Idaho	120,000	3,600,000
Garden City, Kansas	8,000	320,000
Huntley, Montana	30,000	900,000
Sun River, Montana	16,000	500,000
North Platte, Nebraska-Wyoming	118,000	4,100,000
Truckee-Carson, Nevada	150,,000	4,500,000
Hondo, New Mexico	10,000	336,000
Carlsbad, New Mexico	20,000	600,000
Rio Grande, New Mexico	10,000	200,000
Lower Yellowstone, Mont.-N. D.	67,000	2,700,000
Buford-Trenton-Williston, N. D.	30,000	1,000,000
Klamath, Oregon-California	50,000	1,400,000
Umatilla, Oregon	20,000	1,140,000
Belle Fourche, South Dakota	100,000	3,400,000
Strawberry Valley, Utah	35,000	1,350,000
Okanogan, Washington	9,000	500,000
Treton, Washington	24,000	1,400,000
Sunnyside, Washington	50,000	2,000,000
Wapeto, Washington	20,000	600,000
Shoshone, Wyoming	100,000	4,500,000
Total	1,587,000	$57,046,000

Some of the projects, Mr. Davis says, are capable of greater extension than that indicated in the foregoing table. And in addition several large projects have been investigated and found feasible. No detailed estimate of acreage or cost has as yet been made, but the following table shows a rough approximation on these points:

Projects.	Estimated acreage.	Probable cost.
Little Colorado, Arizona	80,000	$4,000,000
Sacramento Valley, California	500,000	20,000,000
San Joaquin Valley, California	200,000	8,000,000
Colorado River, Colo., Utah, Cal., Ariz.	750,000	40,000,000
Dubois, Idaho	100,000	4,000,000
Lake Basin, Montana	300,000	12,000,000
Las Vegas, New Mexico	35,000	2,100,000
Urton Lake, New Mexico	45,000	2,000,000
Walker-Humboldt Rivers, Nevada	500,000	15,000,000
Red River, Oklahoma	100,000	4,000,000
John Day River, Oregon	200,000	10,000,000
Weber, Utah	100,000	5,000,000
Big Bend, Washington	750,000	30,000,000
Goshen Hole, Wyoming	120,000	5,000,000
Total	3,780,000	$161,100,000

While the 1,587,000 acres of new lands added by irrigation will in itself be a factor of small importance in the wheat crop of the country, it really has more significance than the figures indicate. That is, the irrigated lands will provide homes for agriculturists who will extend their activities by means of dry farming. In this way additional lands not now available will be brought under agriculture, and some part of such new acreage will of course be devoted to wheat.

DRY FARMING.

The area in America that may, within a decade or two, be brought under cultivation by means of dry farming and the use of seeds suitable for regions of light rainfall, is so great that one hesitates to estimate it even in his own mind. Besides America, there is a large area in Western Canada that will rapidly come under cultivation; and in time (it will be many years) the arid and the semi-arid areas of Argentina, Australia and eastern Russia will give a vast new acreage to wheat.

Southwestern Saskatchewan, southern Alberta, Montana, the western part of the Dakotas, Nebraska and Kansas, and the eastern part of Colorado include the region that will, in the near future, have an influence on the wheat crop of the United States and Canada. West of the Rocky Mountains dry farming is already a factor of local importance in certain districts.

The proper culture of the soil is only part of successful dry farming. The selection of the seed is also a very important feature; and in this the Department of Agriculture has for several years been devoting some of its activities. The men who are sent to foreign countries

to find new grains are called "explorers," and one of these is Mr. D. G. Fairchild, who is quoted as saying:

"The greatest surprise to the agriculturists and one that will throw into confusion the calculations of the economist, will come through the utilization of what are now considered desert lands, for the growing of special arid-land crops requiring but a fraction of the moisture necessary for the production of the wheat and corn of the eastern half of the United States.

"We are finding new plants from the far table-lands of Turkestan and the steppes of Russia and Siberia, that grow luxuriantly under such conditions of aridity that the crops of the Mississippi valley would wither and die as though scorched by the sirocco."

Another writer, Mr. G. E. Elliott, secretary in 1905 of the National Irrigation Association, says that the recently introduced macaroni or durum wheat "would confuse the prophesies of the Englishman Malthus, who long ago calculated that within a measurable time the human race would be obliged deliberately to block its own increase lest its numbers should surpass the food-producing power of the earth; and later Sir William Crookes, who forsaw within a few decades all the wheat-producing area of the world taxed to its utmost with an increasing population crying unavailingly for bread." Durum wheat, Mr. Elliott believes, has found for itself an area in the American Desert as vast as the state of Texas; an area now occupied principally by sage brush and cactus.

Mr. Mark A. Carleton, cerealist, of the bureau of plant industry of the Department of Agriculture, and who introduced durum wheat into America, says that this wheat "will grow with ten inches of rainfall, and

yield fifteen bushels to the acre where ordinary wheat is an absolute failure." But this is a digression from dry farming.

In the fall of 1907 a Montana correspondent of the Commercial West of Minneapolis, wrote from Billings that all the land susceptible of being irrigated, except on an extensive scale, having been taken up, considerable attention was being paid to "non-irrigated farming" in that county. The success of the so-called Campbell system having been demonstrated by actual practice in the northern part of the county, much land hitherto regarded as valueless, save for grazing purposes, was being taken up by new arrivals. At Broadview, about thirty-five miles north of Billings, a considerable colony of Iowa farmers was establishing itself. The correspondent said that more than 100 families had located there and many more intended to come during the winter. This is given merely to show the tendency. Agriculturists are beginning to understand the possibilities of the dry regions.

Many settlers have gone into eastern Colorado, and the Agricultural Experiment Station at Fort Collins has done a great deal to enlighten settlers and prospective settlers regarding the soil, climate and the methods necessary to insure success.

In a bulletin issued by the Station in 1907, Mr. W. H. Olin says:

Many hundreds of farmers unfamiliar with the soil and climatic conditions of our eastern plains are coming to make homes on 160-acre farms in eastern Colorado, in a region where crops have not been generally grown. Preparation of the seed-bed is the most important thing in farming the non-irrigated lands, and as soon as spring crops are in, the new settler should plow and cultivate

his field he expects to seed to fall crops, or the following spring's grain.

Summer culture is an essential of the eastern Colorado farmer's success. The French found some centuries ago that "manœuvering" the land—causing the particles of earth to change place by tillage—made it more productive. Experiments now show that summer tillage in our semi-arid lands has an added value; it conserves the moisture, while it renders more plant food available. Good results have been obtained in eastern Washington, eastern Oregon, Utah, and many sections of Colorado from summer culture of the land every other season. It has been found that in this way sufficient moisture can be stored from the year's rainfall to mature a crop in many localities.

After the snows of winter have melted in the spring, plow the ground at least seven or eight inches deep. With disc harrow, corrugated roller, imperial pulverizer, or packer, level and firm this ground as soon after plowing as possible, at least not later than each half day, and follow up with smoothing harrow to establish the earth mulch to check evaporation. This mulch must not be too fine, as the winds of the plain will tend to rift the soil or blow the earth mulch entirely away. If possible, stir the surface soil with a good spike-tooth or acme harrow several times through the summer from two to four inches deep. Follow every summer rain with a good harrowing of this "summer cultured" ground, preventing the formation of a crust at the surface. Keep this ground free from weeds.

Ground that has been well cultivated for several years will produce two crops in succession and can be given summer culture the third year. In this way it is possible to grow two crops in three years on well-tilled soil. If a farmer expects to cultivate 80 acres, he should divide it into two crop divisions—cropping 40 acres the first year and giving summer culture to the other 40 acres. This gives him a crop on one-half his land each year while he is storing up moisture in the soil reservoir

of the other half to make the next year's crop. A farmer on the non-irrigated lands of Weld county last season, after seeding his spring crop, at once prepared his fall wheat seed-bed, 150 acres. The writer visited his field early in July and found his seed-bed in a fine mellow, moist condition for seeding. Just a few miles from this careful farmer's ranch was a 500-acre field which had been simply plowed and left in that condition to dry out and become hard. Although an inch of rain had fallen the week previous, the soil in this field was in very poor mechanical condition, dry and hard. This clearly shows how not to do.

One of the writer's correspondents, living ten miles south of Akron, Colo., has practiced summer culture for several years. He reports that in the fall, when he seeds his summer-cultured land, he often finds from three to five feet of moisture.

This in brief is "dry farming;" and what is true of eastern Colorado is true of western Kansas, Oklahoma and northwestern Texas. Dry farming will add many millions of acres to the wheat lands of America, and great areas will be cultivated in the time taken by Congress to deliberate over one appropriation for irrigation.

In writing of dry farming in the Great Basin (principally western Utah and all of Nevada) Mr. Carl S. Scofield, in charge of Western agricultural extension investigations, Department of Agriculture, says:

"From the modest and tentative beginnings of a third of a century ago there has grown a well-established system of farming in some parts of the country west of the Rocky Mountains. There are in this great area three well defined regions in which dry farming is now practiced to a considerable extent. For the convenience of designation these regions may be named the Great

Basin, the Columbia River Valley, and the Interior Valley of California."

Mr. Scofield summarizes his investigations west of the Rockies as follows:

Dry farming in the Great Basin is limited at present almost entirely to the state of Utah, where it has been carried on to some extent since 1875 and its practice has been rapidly increasing since 1900. The work was initiated by private experiments, but the state of Utah is now supporting six experiment farms for testing varieties and working out scientifically the best rotation and tillage methods.

The precipitation comes during the autumn, winter, and spring months, differing in this respect from the precipitation on the dry lands east of the Rocky Mountains, where it comes during the summer months. Farming is successfully carried on with an annual average rainfall of 15 inches or slightly less. The annual variation in rainfall is considerable and the year 1906 was unusually wet. Local topography has a marked effect on the amount of rainfall.

Clean summer fallowing and alternate-year cropping, together with thorough tillage, are the basis of successful dry farming in the Great Basin.

Wheat and alfalfa are the most important crops now grown on the dry lands of the Great Basin. Thin seeding is found essential to the best results with these crops.

Under the best methods of tillage the land appears to remain highly productive even where no other crop than wheat is grown.

Dry farming is now used only as a supplement to irrigation farming. There have been few attempts to make homes on the dry lands.

The independent extension of farming on the dry lands depends upon the development of underground water for domestic use.

CHAPTER XXIX (Continued).

SOIL EXHAUSTION.

In the early days of gold-digging in California, the reckless horde of miners paid no attention to any but the richest-yielding ground; they wanted nuggets. As a result, much rich ground was worked carelessly; and the more thrifty miners of later times, perhaps with the aid of modern appliances, have found rich diggings in the old worked-over gulches. But such grounds, since the last working, are exhausted. No more gold can be taken out unless some is first restored to them.

So it was with the first settlers of the wheat lands of the Central states and later of the Western. They took the best from the ground, and those who have come after them have worked the ground closer and more thriftily; and while the soil of the great Central and Western prairie states still contains wealth, it is not so generously distributed nor is each harvest so certain of its share as formerly.

While crops of wheat might be raised for many years to come, the profit from exhausted or partially exhausted lands is small. Gold must be restored to the lands to insure rich harvests for future generations or even for the present one.

The average yield of wheat per acre in most of the old states is deplorably low; and this fact recently moved a large, practical farmer who operates several farms, Mr. Samuel W. Allerton, to write an article, which was published in the Saturday Evening Post. Mr. Allerton said:

"The reckless and wholesale depletion of the fertility of the soil in this good land of ours is beyond all question the biggest and most serious problem now confronting the American people."

The writer pointed out how many farmers had committed "agricultural suicide" by robbing the soil of its fertility and abandoning it as worthless, in some of the Southern states. Writing of Illinois, he said:

"In southern Illinois there are large districts that produce scant crops and where farms can be bought at one-third—even a fourth—of the price of good farm lands in the middle and northern part of the state. Ordinarily these southern Illinois farms were nearly, if not fully, as productive as any in the state. They have been under the give-nothing-and-take-everything system of cultivation, and the result is that the land has been put out of business because of mistreatment.

"And so it is in every state where the land has been worked on this plan for any considerable number of years."

The extent of the areas over which this waste of productivity is going on, Mr. Allerton asserts, is but faintly realized, and this reckless waste is the "big problem of the nation, with which we are speedily coming face to face."

In Minnesota the lands have been cultivated long enough so that the soil exhaustion is a matter for serious consideration. Regarding it, Prof. Harry Snyder, chemist at the Experiment Station, says that continued cropping of soils to grain crops without any system of rotation or other treatment is telling severely upon the original stock of half decomposed animal and vegetable matter and nitrogen. Soils that have produced grain crops exclusively for ten or fifteen years contain from a third to a half less humus and nitrogen than adjoining soils that have never been plowed.

Soils that have been cropped until the organic matters and humus have been materially decreased, retain less water and dry out more readily than where there is a larger amount of organic matter present in the soil.

The following incident of soil retaining moisture because of being well manured, came under Professor Snyder's observation:

One-half of a sandy knoll, heavily manured with well rotted manure, contained nearly a quarter more water during a six weeks' drouth, than the other half that received no manure.

In a bulletin published by the Minnesota Experiment Station the following conclusion was given as the result of experiments:

"When wheat was grown continuously on the soil for eight years, there was a loss of 1,700 pounds per acre of nitrogen, about 300 pounds being utilized as plant food and 1,400 pounds lost by the decay of the animal and vegetable matter of the soil and the liberation of the nitrogen as gaseous and soluble compounds. During the eight years of continuous wheat cultivation there was a loss of over 21 per cent. of the total nitrogen

of the soil, equivalent to an annual loss of 175 pounds per acre in addition to that used as plant food."

A field in Blue Earth county, southern Minnesota, was recently pointed out to the writer, on which wheat had been grown for thirty consecutive years. It had been fertilized with farm manure, as most lands are in southern and central Minnesota, but had never grown any crop but wheat.

INCREASED YIELD PER ACRE—COMMERCIAL FERTILIZERS.

An increased yield per acre in wheat must be looked for in fertilization, crop rotation, better farming methods, and in better-yielding seed.

But the matter of increased yield is a problem in human nature. Considering only the lands, it would be easy; but when the owners of the lands become the greatest factor in the proposition, it at once becomes apparent that time must play an important part in the bringing about of a material increase in the average yield.

The intelligent use of commercial fertilizers on the wheat fields from Minnesota to Pennsylvania might result in largely adding to the yields. But that is out of the question, for several reasons. The first reason is the cost, and the next is the farmer. As a general proposition commercial fertilizers are in the nature of a speculation: perhaps the increased yield will pay and perhaps it will not. But the point that the farmer sees is that his money goes out in advance in any event; and the farmers of the wheat states have not yet acquired the habit of casting their bread upon the waters even as a commercial venture.

In France, Belgium, Germany, and Great Britain commercial fertilizers are largely used, but conditions are

very different from those in America. The price of wheat is higher, therefore the cost of fertilizers is relatively less. Furthermore, the fields are smaller, and intensive farming is possible.

Some experiments have been made in Minnesota with commercial fertilizers by the Experiment Station, since 1900; and some of the conclusions arrived at will be given here. At the time these fertilizers were sent out, they were quoted on the St. Paul market as follows: Complete fertilizer, $25 per ton; acid phosphate, $15; and nitrate of soda, $50.

The experiments were conducted in several different counties and on the farm at the Station.

In the case of old soil that was reduced in crop-producing power because of exclusive grain culture until it produced only seven bushels of wheat per acre, it was found that an application of nitrogen, phosphoric acid or potash, alone or in combination, did not result in raising the yield more than 3.6 bushels per acre, not enough to pay for the fertilizers. The commercial fertilizers failed to give as large yields per acre as was secured from adjoining land kept in good state of fertility by the rotation of crops, the use of farm manures and the cultivation of clover.

On a grain-cropped soil, where clover had grown, applications of phosphoric acid and potash resulted in increasing the yield eight bushels per acre, sufficient to pay for the fertilizers used, while the addition of nitrogen did not prove economical.

In one of the experiments phosphoric acid alone gave beneficial results, causing an increase in the crop yield of four bushels per acre, and in other tests its use produced a better stand of clover.

At the Experiment Station, on land in a fair state of fertility, which without fertilizers produced 27 bushels of wheat per acre, no appreciable increase was secured from the use of commercial fertilizers.

The results taken as a whole indicate that commercial fertilizers should not be used indiscriminately on old soils with a view to securing large yields, and it is not feasible, by the use of commercial fertilizers alone, to economically restore the fertility to soils that have been impoverished by exclusive cropping to small grains.

It was concluded that commercial fertilizers are of great value when judiciously used in a rotation of crops and for encouraging the growth of clover, so as to add nitrogen to the soil from atmospheric sources. It is believed that when they are used in this way they will prove beneficial and remunerative. Commercial fertilizers cannot take the place of farm manures or crop residues, particularly those from clover and timothy, for permanently improving the soil.

CROP ROTATION.

Wheat is not necessarily an exhaustive crop; it is rather the lack of systematic and intelligent cultivation of the soil that causes the decline in fertility—the loss in nitrogen. And the results that have been secured by a systematic rotation of crops, prove beyond all question that any properties lost one season can be restored the next; and that the land can be kept at a high-producing point indefinitely.

In fact, the restoring of old wheat lands, and, furthermore, the keeping of the average yield per acre up to the yield of new lands, has been done in instances and can be done generally; and the only feasible way

is by means of crop rotation and the practice of more thorough cultivation.

There are not only greater possibilities in this direction than any other, but there is a prospect of early results; and these will come through the teachings of the agricultural colleges and the state experiment stations. In addition to these, model farms will soon be a factor of the agricultural institutions: in this feature of education we are a long way behind Hungary.

Crop rotation as a means of increasing the yield of grain is something practical; something that appeals to the farmer of intelligence; and, moreover, it is something that he can do, and nothing he has to buy.

Crop rotation means systematic farming; and before it is possible to plant crops in rotation, it is necessary to divide the farm into several fields, from three to six, of the same size. How to do this to the best advantage is being taught to the thousands of young farmers at the agricultural colleges in the Western states. The results will be very marked within a few years. System in the operation of a farm means as much as it does in any business enterprise.

Some of the results of experiments in crop rotation in Minnesota are exceedingly instructive; and they point conclusively and not theoretically to a gradually increasing yield per acre of grain, which means the permanency of a large acreage in wheat.

The result of one set of experiments that was continued through twelve seasons will be given. A field for the experiments was taken on which different grains had been grown for about forty years.

In the spring of 1892 the field was divided into six plots, and all were sown to wheat to determine whether

the soil was uniform. It was in fair condition, although somewhat reduced in fertility as a result of several consecutive seasons of wheat growing. The plan of the experiment was to grow wheat, corn, oats and barley continuously on four of the plots, while on the other two, crop rotation would be practiced. Only the results from the plots on which wheat was grown will be given here; and the table that follows shows the yield per acre for each year.

On Plot No. 1 wheat was grown every year without change. On Plot No. 2 the crops were rotated as shown; the grain is in bushels and the clover in tons.

	Plot No. 1.	Per Acre.	Plot No. 2.	Per Acre
1893	Wheat	12.3	Wheat	13.7
1894	Wheat	8.9	Clover	2.16
1895	Wheat	17.3	Wheat	22.
1896	Wheat	14.1	Oats	31.4
1897	Wheat	10.2	Wheat	14.2
1898	Wheat	*25.2	Clover	1.41
1899	Wheat	17.6	Wheat	19.5
1900	Wheat	18.8	Wheat	24.4
1901	Wheat	16.2	Oats	58.7
1902	Wheat	18.3	Corn	not given
1903	Wheat	18.6	Wheat	30.
1904	Wheat	13.7	Clover	3.98

*In 1898 wheat yields were unusually large throughout the country.

While the chemical changes that took place in the soil of two plots might be given, the practical results seem sufficient. In comparing the average wheat yields for the years wheat was grown on Plot No. 2, it is seen that the yields on the latter were largely in excess of Plot No. 1, on which wheat was grown continuously. In 1903, the yield on Plot No. 1 was good, 18.6 bushels, but on the crop-rotation plot the exceedingly satisfactory yield of 30 bushels to the acre was secured.

BETTER FARMING METHODS.

From careless practices to intensive farming is a long jump, and the difference is a matter of some fifteen to twenty bushels an acre. While intensive farming is only for the small farmer with but a few acres, there is, taking the wheat states as a whole, room for materially increasing the crop on the present acreage by better cultivation. And this aside from crop rotation and the use of commercial fertilizers.

Every observer must arrive at the conclusion, for instance, that considerable actual area is lost by carelessness or wastefulness in plowing or seeding, or both. Then there is the matter of the right depth of plowing and the best treatment of the soil thereafter; all of which are questions of development and which the agricultural colleges and the experiment stations are impressing on the younger generation of farmers.

The Kansas Experiment Station has found by experiments that the time of seeding has an important bearing on the yield. It has also found that the rather common practice of pasturing the wheat fields in the fall and winter reduces the yield. On this point Professor Georgeson says: "The theory so commonly held that pasturing, in some unexplained manner, benefits the wheat, is not upheld by experiments. Pasturing injures the wheat and reduces the yield. The real question at issue is whether the value in feed thus obtained will balance the loss in yield, and this cannot be ascertained in experiments on a small scale. If we can learn what the probable loss in yield is in average cases, then each farmer can decide for himself whether he will pay that amount in value of wheat for the feed afforded. It

should be borne in mind, too, that it is the general practice in pasturing wheat to let the stock run on it all winter and spring, and too often in all kinds of weather, wet or dry, and thus the wheat commonly suffers more than shown, as in these experiments the cattle were not allowed on the plots when the ground was wet, nor was the wheat kept eaten down for a long period."

Professor Shelton says that spring pasturing would appear to be less objectionable than fall, although it is observed that the yield is cut down in each instance. The season and stand must be taken as important factors always, and even then each farmer must settle this question for himself, Will the amount of green feed I gain for my cows compensate for the diminished grain yield resulting from pasturing my wheat-fields? A difference of from two to three bushels per acre was shown in the agricultural college experiments in favor of not pasturing wheat fields. This will mean, at usual prices, from $1.50 to $2.75 per acre loss from pasturing the wheat. If these experiments can be taken as showing normal conditions, then the farmer can compute the cost of pasturing his wheat under ordinary crop conditions.

Neither crop rotation nor the use of fertilizers has yet been found necessary in central Kansas, and good yields have been obtained year after year without even the use of manure on the wheat lands. But, of course, it is only a matter of time when the farmer who anticipates the failing of the soil will get high yields while his careless neighbor will receive less wheat to the acre.

BETTER-YIELDING SEED.

There can be no question but that the wheat crop will gradually be increased by means of better-yielding

seed,—either new varieties or improved sub-varieties, or both. In Chapter XXIV, on Minnesota, mention is made of two thrifty sub-varieties of blue-stem wheat, and wheat breeding is described. No further mention of them need therefore be made here. In Kansas the wheat growers occasionally import fresh seed (the hard winter or Turkey red) from southern Russia, and so the high standard is maintained. This wheat is also gradually working northward, and in localities in the southern part of South Dakota it has taken the place of the lower-yielding blue-stem.

The tendency toward better-yielding varieties of wheat is one that the pessimist cannot safely ignore; still, the optimist should not permit himself to be carried away with it and predict too much for the immediate future.

As durum or macaroni wheat has, since 1903, become a factor in the spring wheat crop, and so much is predicted for it in the semi-arid regions, the writer is constrained to give some particulars regarding it, without prejudice. This wheat has met with great opposition by the spring wheat millers, but the farmers have persisted in sowing it because of the high yields. Yet the price in the Minneapolis and Duluth markets has ranged from 10 to 18 cents a bushel under No. 1 northern. This wheat was introduced by the Agricultural Department, and it was never recommended that it be sown in the Red River Valley nor in Minnesota; yet it has worked into the region of "sufficient rainfall," although it is a semi-arid plant.

Regarding the durum or macaroni varieties and their original sources, Mr. M. A. Carleton, cerealist of

the bureau of plant industry, Department of Agriculture, says in a letter to the author of this book:

"Kubanka or Beloturka (the variety mostly grown in the United States) is one of the numerous varieties of durum wheat that have been introduced by the Department of Agriculture and others from Europe and Africa during the past six or seven years. Of these various varieties much the most important ones are the following:

"Kubanka, Beloturka, Velvet Don, Black Don, Gharnovka, Yellow Gharnovka, Sarui, Pelissier, Medeah, Kahla, Maruani, Adjini, Bachir.

"The first seven varieties are from eastern and southern Russia, the remainder from northern Africa. Of course, numerous other kinds were obtained from these regions and from other countries of the world. There are probably fifty distinct kinds of durum wheats in all. As a class the North African or Algerian wheats are better adapted to macaroni making than the Russian, while the Russian varieties are better for bread flour. Of the Russian varieties the Kubanka, Beloturka and Sarui are much the best for bread; but the Sarui is not well known, so that it leaves practically the Kubanka or Beloturka or both as being the great durum bread-wheat of Russia, now found also much the best for that purpose of all the varieties introduced in this country. This wheat, too, makes up at present practically all the crop now grown in the United States.

"As to these two names there is yet a little confusion. Apparently the Kubanka is really the better, although what we are now growing is most likely the Beloturka, and they are probably really distinct, the Beloturka having a longer head while the Kubanka is shorter, and therefore has proportionally longer beards. Both of these have a cream colored or golden chaff, and a light amber grain, which, when of good quality, is almost completely translucent and very flinty.

"The Arnautka is the wheat originally known as 'Goose wheat,' and corresponds to the Beloturka. A

variety known as the Nicaragua, known many years ago in Texas, somewhat resembles in shape and appearance the Beloturka, but has a rather darker chaff and seems to be quite inferior in quality. Though our introduction of Kubanka was made under that name, given it by the Russian people, the seed was necessarily considerably mixed, being obtained from Kirghiz farmers in eastern Siberia, and it seems to me now probable that there were really more of the longer heads in the mixture than the short ones, so that the variety would really be correctly called Beloturka, though it is now generally known in this country as Kubanka. The one or the other of these two makes up probably fully 95 per cent. of the entire durum wheat crop of the Volga region from Kazan to Astrakhan."

WILL THE UNITED STATES BECOME AN IMPORTER?

It is occasionally asserted with confidence by writers that the United States will become an importer of wheat; that the consumption, due to the rapidly-increasing population will overtake the production, and that then we shall find it necessary to draw upon outside sources.

If the import duty of 25 cents a bushel should be abrogated or reduced, America might be an importer in short-crop years. But it does not seem probable that we shall be an importing country while the duty remains, for the reason that prices will be so high should we, year after year, approach the dividing line between exports and imports, that the farmers will increase their wheat acreage.

The price of wheat in Canada, except when the crop is short, is fixed by the export demand—Liverpool plus freight and necessary charges. At the same time, with little or nothing for export in the United States the price could and would range from 10 to 20 cents

higher, relatively, than in Canada; and nothing could be imported until the price were 25 cents higher, relatively, at Minneapolis, Duluth, Chicago, Buffalo or the seaboard.

Furthermore, with America a very small exporter, say 30,000,000 bushels or so (and this mainly in grades of flour that find no market in America), European prices would average higher than they have during the last ten years. This would raise the price basis in America still higher, and when the greater part of the duty were added, there would certainly be profit in raising wheat. And, after all, it is only a question of profit; give the farmer the price, say $1 in Chicago, and there will be no necessity to import wheat.

Yet there are two conditions under which small amounts of wheat may be imported. One is to grind it in bond, the flour from which will be exported. Then, again, late in the crop year and just before the harvest of a new crop, supplies might be so reduced, some years, that it would be found necessary or convenient for millers at New York to import a little cheap Argentine wheat. Yet these conditions, even should they obtain, will not make America an importing country in the sense that the term is understood.

PART II.—THE MARKETS.

CHAPTER I.

GRAIN EXCHANGES.

Central Markets a Result of Evolution—A Difference Between American and European Markets—Extremes of Legislation—Effect in Germany—Movement Against Future Trading in America—Two Sources of Opposition—Grain Exchanges and Bucket Shops—Exchanges and the Farmer—The Evil of Manipulation—The Manipulator a Trade Pirate—His Methods—A Big Miller's View of the Exchanges.

SEVERAL hundred years ago, it does not matter how many, in that very old commercial city of Italy, Genoa, the buyers and sellers of grain would congregate around a certain stone near the docks. For many generations they met and traded here by general consent. But finally something more systematic seemed desirable, and an association was formed, rules were adopted, and after a time a building was erected for the greater convenience of buyers and sellers. The Genoa Grain Exchange of today, an active though local market, is the outcome. It was a natural evolution.

In the reign of King Edward I of England, in the year 1285, Mark Lane, or Mart Lane it was first called, came into existence. The records show that "a lane behind Blanch Appleton was granted to be enclosed." It was called Mart Lane because of a market place near by.

Yet it was not until several hundred years later that there was a market of any importance there. The first building for a market was erected in 1747. This was hardly a building, either, for it was an open quadrangle; still, "it was not without architectural pretensions."

This building, an old member of the Corn Market writes, was the result of a compromise between the Essex farmers and factors who met in Aldgate, and other dealers who met in market at Bear Quay, in Thames street, where most of the vessels that brought grain to London discharged. This was the beginning of the Corn Market in Mark Lane, which, after the repeal of the Corn Laws, became the center of the immense international trade in grain that followed. This is another example of the natural evolution of a grain market.

Grain exchanges began to be organized in the wheat states of America in 1848 and '49; they were the natural and necessary outgrowth of the increasing crops, which required central markets and concentrated interests. The receipts of grain at the different centers and its necessary storage in bins, evolved the system of inspection and grading, the separation of the different grades in the elevators and the sale of it by grades.

The genius of Americans, which has been displayed in so many directions, worked out the most perfect system of grain handling in the world; and likewise the most perfect market system.

Apparently the only defect in the market system, if the system is at fault, is that it makes speculation too easy; that is, speculation by people outside of the grain trade—the public.

A broad difference between the grain exchanges of America and those in Europe is that, in the markets of

Europe, with the exception of Budapest, the trading in wheat is almost entirely confined to the members of the grain trade. The wheat markets on the continent have all been more or less subject to "agrarian" legislation and prejudice, while the older prejudice against trading in breadstuffs has left its mark in England. A few years ago an attempt was made by the agrarians in Hungary to place restrictions on the trading in grain in the Budapest market, but it was unsuccessful.

The extreme to which adverse legislation was carried in Germany is widely known in a general way. In brief, the Bourse law of 1896 prohibited future trading in grain and placed other restrictions on the trade. The result was that the Berlin brokers "seceded" and there was no open market at the Bourse; no quotations. No one had any trustworthy price basis, and the grain growers were at the mercy of the provincial dealers. It is said that the government at once recognized the disadvantages to all business interests through the lack of an exchange with its official quotations, and it was not long before the minister of commerce opened negotiations with the brokers; but no agreement was arrived at until January, 1900. By that time even the agrarians felt the necessity of an exchange. For although the growers could sell their grain in advance of delivery, they could not do it advantageously because of the absence of official quotations; and, moreover, there was no board of appeal for adjusting differences in grading.

The Berlin Produce Bourse was reopened on April 2, 1900. The methods of trading are described in Chapter XVII, The Berlin Grain Exchange.

Western Canada, at the beginning of 1908, faced much the same proposition that confronted Germany in

1896. The Winnipeg market is the only market of any importance in Canada, and the Winnipeg Grain and Produce Exchange is the organization that built it up and which makes the official quotations. The Grain Exchange has its charter from the Province of Manitoba, but the market system is after that of American exchanges.

In February, 1908, a bill was passed by the Manitoba legislature that will have practically the same effect as the agrarian legislation of Germany had on the Berlin market. The Winnipeg market is, however, given a chapter to itself.

Several bills to prohibit future trading were introduced in the United States senate and house of representatives during the 1907-08 session of Congress.

Laws have been enacted prohibiting future trading in cotton in South Carolina, North Carolina, Georgia, Arkansas, Texas and Alabama; and efforts toward that end were in progress during the winter of 1907-08 in Mississippi and Louisiana. As the principle and the general system of cotton and grain markets are the same, it may be assumed that the spirit of opposition is the same; that the motives that prompt legislation against them are the same.

Legislation inimical to the present system of trading in grain and cotton is only another expression of the old prejudice that has long existed in the minds of agriculturists regarding those who handle the products of their lands. The middleman has never been looked upon with favor by the grower, nor even as altogether necessary; and the more complicated the system of handling and storing, and trading in, grain and cotton, the less the agriculturist likes it.

Apparently, however, he does not give full considera-

tion to the very important fact that grain and cotton are commercial commodities as well as agricultural. When grain and cotton leave the growers' hands they become factors in the world's commerce; and the best way to trade in them in the markets, to grade, to store, to finance and finally to move along when needed by the manufacturer, may not appeal to the grower. Yet it may be the best way, nevertheless.

The opposition to exchanges and to future trading comes from two sources, but mainly from one, the agriculturist. His antagonism to exchanges is largely because of future trading, which, he believes, depresses prices. Short selling is synonymous with price depression to many people.

Future or margin trading is opposed by many people because they see in it only the speculative features. Much confusion is often caused by those who have a superficial knowledge of margin trading in the stock market, but no understanding whatever of margin or future trading in cotton or grain, attempting to draw conclusions regarding the latter. Margin trading in the stock market and future trading in grain or cotton have nothing in common.

The United States Supreme Court, in a decision given May 8th, 1905, relating to the buying and selling of grain for future delivery, said:

"People will endeavor to forecast the future and to make agreements according to their prophecy. Speculation of this kind by competent men is the self-adjustment of society to the probable. Its value is well known as a means of avoiding or mitigating catastrophes, equalizing prices and providing for periods of want. It is true that the success of the strong induces imitation by the weak, and that incompetent persons bring themselves to ruin by

undertaking to speculate in their turn. But legislatures and courts generally have recognized that the natural evolutions of a complex society are to be touched only with a very cautious hand, and that such coarse attempts at a remedy for the waste incident to every social function as a simple prohibition and laws to stop its being, are harmful and vain."

While the opposition to grain and cotton exchanges principally comes from the agriculturists, much of it has been instigated by the bucket shops, either for revenge or to intimidate the exchanges and cause them to cease their attacks on the bucket shops.

A bitter warfare has long been, and still is, raging against the bucket shops, and while they have been suppressed in some states, it has so far been impossible to drive them out of others. It is probable, however, that a federal law will be enacted that will suppress them for all time.

The difference between a grain or a cotton exchange and a bucket shop is about the difference between Dr. Jeckell and Mr. Hyde.

An exchange serves as useful and necessary a purpose as a bank. A bucket shop uses the quotations of the exchanges for gambling purposes; betting against its customers that the next quotation will be higher, or lower, as the case may be. There is no difference in principle or spirit between a bucket shop and a pool room; for the orders to buy or sell grain or cotton are never executed. They are bets, not orders; and the "house" takes them all, and against its customers.

Grain exchanges are corporations, governed by a board of directors elected by the members; and the exchanges do not have any transactions in the markets. The

corporation or association provides a place in which the buying and selling are done by its members; and one of its chief functions is to make and enforce rules for such buying and selling.

Besides officially recognizing the prices made daily in the exchanges, the associations perform a valuable service by widely distributing the quotations and permitting them to be distributed, thus placing it within the power of every one interested to learn the value of commodities.

An important function of the Chicago Board of Trade is the gathering of crop information from all countries, and this is supplied to other exchanges by its members by means of private wires, and given to the press. Members of the exchanges are continually gathering and disseminating crop and commercial news. And so information that could not otherwise be obtained is supplied to the readers of the market pages of the papers; and the farmer is kept as well informed on the condition of the crops of other countries and of the markets as are the brokers themselves.

After close association with, and study of, the markets for some ten years, the writer believes that if there are any weak points in the general system (and there are some) they are not opposed to the agriculturist's interests. In fact, it is impossible to see how he could be better served than he is, from the buying of his grain at the railroad station to the final selling of it to the miller or the exporter.

When the farmer's crop is ready to market, he may ask, and he has a right to ask: Is the price that I get all that I could get under any other general market system? Are there any undue profits made anywhere between pro-

ducer and manufacturer? Are the systems of inspection, grading and weighing such that my interests are fully protected?

Under the present market system the cost of handling grain and cotton,—that is, buying it of the producer and selling to the manufacturer at the great market centers,—has been reduced to an extremely small percentage of the value of the article. There is no other commodity in the world on which the middleman makes such a small percentage of profit as on grain and cotton; and this advantage to the grower is directly due to the present market system, which permits the handling of these commodities without the usual commercial risks. Remove this safeguard, and it is easily apparent that the margin of profit in handling must be increased, in order to guard against losses; and the producer would suffer.

The farmer is, in fact, well represented on the floor of the grain exchanges, though he does not realize it. A large part of the active membership of exchanges is made up of commission men, dealers who sell, on commission, the grain that is shipped to them from country buyers or farmers. These commission men get a fixed rate of commission, but they strive to get the highest possible price for the grain, because a satisfactory transaction insures them further business. Many farmers ship their grain direct to the Western markets, and they are safe in doing so; for the rules of exchanges make it compulsory for the commission houses to report the name of the purchaser of all grain, and the hour on which the sale was made. In Minnesota the weighing and inspection departments are state institutions, and certificates are sent to shippers.

The greatest evil of the American grain markets, and cotton, too, for that matter, but one that should give the

grower no concern, is manipulation by a few powerful and daring traders; men who ignore commercial ethics, defy trade opinion, and who endeavor to draw the public in to the market and finally, during the excitement of a bull market, sell out and let the public "hold the bag." These are the men who have brought the exchanges, or rather, the system of future trading, into bad repute. They at times demoralize the grain trade and the milling business; they inflame the public passion for gambling; they take the public's money, and they bring discredit upon the grain trade as a whole.

But that there is manipulation in the markets is not the fault of the market system. Manipulation and attempted corners in grain and cotton do not call for legislation and drastic laws, but for sufficient moral courage on the part of the directors and members of the exchanges to suppress them. Manipulation is deplored by the trade as a whole, and might easily be suppressed. That such open manipulation is permitted as is practiced in the Chicago wheat, corn and oat pits by a few powerful traders, while at the same time 90 per cent. of the members of all the grain exchanges are opposed to it, passes comprehension; and, doubtless, a few generations hence, the tales of our "squeezes" and corners and manipulated markets will be read with the same excited interest that we now read of the old buccaneer days. About the only difference between the old-time buccaneer and the modern-day manipulator is in the way the trick is done; the latter does not use a pistol and cutlas nor cause his victim to walk the plank.

These big traders use the market as if it were their own private affair, absolutely regardless of other members' rights or of the menace their operations are to the

business of others. The absolute controlling of the wheat or oat pit of the Chicago Board of Trade by one man or a set of men is a piece of audacity having few equals in commercial history.

There is a wide difference between the men who buy a large amount of grain as an investment and the men who are called manipulators. The former buy it as they would real estate, and quietly wait for the legitimate demand to advance the price. The manipulator is also an agitator. He makes and magnifies news, creates excitement over crop damage or prospective short crops, gets himself and his views talked about in the papers and endeavors to get the public in the market. But this is only part of the game. He buys immense amounts of wheat, five, ten or even twenty million bushels; he is continually selling on the advances and buying it back on the breaks. Sometimes when the market is strong, he will throw several million bushels into the pit and cause a smash of perhaps five cents; and then buy back his line during the little panic that ensues. This is manipulation. Yet at times he is compelled to support the market—compelled to buy several million bushels to withstand the attacks of those opposed to him; and then there is a beautiful battle for a time. The manipulator may be swamped, or he may buy everything offered and then bid for more, advance the price and finally "run in" the short sellers who dared to oppose him; a process of "money and muscle."

And yet, because the manipulator becomes well hated in the grain trade, and because he usually comes to the sad financial end that is supposed to point a moral, the obligations of the members of the grain trade to commercial, financial and agricultural interests are none the less

binding. If the fall of one manipulator ended the evil race, indulgence for a time might be sufficient; but it does not. One market pirate no sooner drops out of the game than another takes his place; and still others are awaiting their turn.

Personal vengeance by other big members of the trade on a market buccaneer for his practices in the pit, may afford some little gratification; but, of course, the spirit of reform is absent and no real good is accomplished. An instance of this kind will show the feeling that exists toward manipulators by other influential members of the trade.

A certain prominent member of the Board of Trade, through his connection with one of the greatest of the grain houses and by means of the money at his command, became so powerful in the pit that he could influence prices at will. He would buy all the wheat that was for sale and then bid for more; or he would sell all that was wanted and then offer more.

In this way he would "milk the market," repeatedly causing the other speculators to take losses when their judgment was right on general trade conditions. In fact, this manipulator was bigger than the market. He engineered great bull campaigns, but he repeatedly "sold out on" his followers. He seemed to delight in exercising his power by demonstrating that he was greater than all the other speculators combined.

The head of one great Chicago house said, one day, when the manipulator was at the height of his power, "If we ever get him with only a million or two back of him, something will happen. But at present he has too many millions to play with; he is too big for us!"

The day came, as it generally does; and the great

manipulator, the pirate of the wheat pit, saw his power and his glory crumble away like money bet on a tip. He endeavored to work up a bull market at the wrong season, when natural conditions were against him. The losses were so great that thereafter he was deprived of the millions of a great house with which to manipulate the market; and the other big traders "had him with only a million or two back of him." His ventures in the pit were now watched by a host of exultant enemies who had more money than he, who were as merciless and who knew the game as well. He met opposition on every hand; and the enemy, instead of now fleeing from his attacks, overwhelmed him and routed him with great loss time after time. During the first year it was estimated that the erstwhile great manipulator and terror of the pit lost half his fortune; and thereafter he ceased to be a factor in the daily affairs of the market.

"Now we shall have peace and normal market conditions," went up as a sigh of relief from the members of all the grain exchanges. But it was not so, for immediately another manipulator appeared; and instead of taking him by the ear and chastizing him, the members of the Board of Trade said, "It's too bad, too bad!"

Now, partly as a result of the sensational manipulators who have brought discredit to the system of future trading, the exchanges of the country are oppressed and menaced with adverse legislation.

In this connection some of the matter brought out at an "investigation" of the Minneapolis Chamber of Commerce by a committee appointed by the legislature during the session of 1906-07 is of interest. One of the members of the Exchange who was asked to appear before the committee was the manager of one of the big milling com-

panies. Another was the manager of a large elevator company.

The miller was asked what the result would be if the Grain Exchange should be disbanded.

"If the Minneapolis Chamber of Commerce were disbanded the millers would, in my opinion, be able to buy their wheat from 3 to 5 cents a bushel less than they do," was the reply.

"Why are you a member of the Chamber of Commerce?" was asked.

"It is necessary for me to be a member on account of the nature of our business. It is in the Chamber that grain is sold. There is no reason why we should not buy grain from the farmers, but they don't offer us any."

"What is the benefit of the Chamber of Commerce to the millers?"

"There are several. We can always get grain; we are dealing with responsible parties; and are enabled to do business on a more reliable basis. One great risk that we avoid in dealing with the grain firms is the constant danger of buying grain with chattel mortgages on it. When we buy a quantity of grain on the floor we look no further than the firms we are dealing with, and they are responsible for the delivery of the grain."

"Is the Chamber of Commerce of any benefit to the farmers?"

"I think that it is. Without the Chamber and its excellent rules the risks assumed by the farmers in consigning grain would be much greater. Business is done at a closer margin of profits, and the farmer gets the benefit. Under the present system the farmer gets the quotations almost as soon as I do."

Asked about the Minnesota Farmers' Exchange,

which had sought admission to the Chamber of Commerce, the miller testified that some one representing the farmers had interviewed him with the object of devising some plan for direct dealing between the farmers and millers, in order to wipe out the middleman's profit. The plan was not practical. "But," continued the miller, "I told him if he wanted my vote to close up the Chamber of Commerce he could have it."

The elevator manager explained that the Exchange is a benefit to the elevator companies, as it supplies a market in which to dispose of the grain they buy. The membership gives them a standing with the trade and with bankers.

"What would be the result to terminal elevators of the disbanding of the Chamber of Commerce?" was asked.

"We would have to do business on an entirely different basis. Instead of being warehousemen and doing business for the storage charges, we would become merchants and buy the grain. We would then have to have larger margins, as we would have to take chances of the market fluctuations."

In regard to warehouse receipts, the elevator manager said:

"The state weighmaster always knows the amount and grade of grain in the warehouses and in addition to this the Chamber has an inspector who checks up the reports on both the grade and quantity reported. In addition to this the warehousemen are required to give the Chamber a bond equal to 15 cents a bushel on the capacity of the elevator to insure compliance with the rules; and this adds to the value of the warehouse receipts as security for loans. The rates of interest on such loans, with such

security, are as low as on any class of securities in the country. Being able to borrow large sums of money at a low rate of interest facilitates the business of buying and storing grain."

CHAPTER II.

PRICES AND SOME MARKET INFLUENCES.

Price Versus Value—"Next Crop" Influence—Supply and Demand Fallacy—Effect of Gold Depreciation—Speculation and Manipulation—Future Trading—May Wheat Prices.

It is not difficult to account for big advances in wheat prices, nor to point out the chief influencing factors in extreme declines. Big advances are caused by crop failures or manipulation or usually the two combined, while big declines are the reactions from speculative advances, or are caused by the passing from an old crop-year of high prices to a new harvest of abundant crops. Price is one thing; value, another. It is impossible to say at all times whether the price represents the real value. Yet there are times when one can confidently say the price is below the value. Again, as in the case of corners, when the price has been artificially advanced above an export basis and above a price at which millers can profitably grind the wheat, it becomes apparent that the price exceeds the value. The price anticipates conditions, however, and it may be advanced or depressed because of the probability of short or abundant supplies at some time in the future.

The cost of production of wheat never enters into the question unless the price declines to a very low figure. On such declines there are always men ready to buy it for investment, just as bargain-hunters come out of their seclusion when stocks and bonds reach abnormally low levels. When wheat is above 70 cents the cost of produc-

tion never becomes a market factor. There is always some reason for the price being where it is. At 52 cents in Chicago in 1895, for example, there was absolutely no question but that the price was too low; for at that level, the price on the farm was below the cost of production. Yet with great business depression on every hand, with railroads in the hands of receivers, and with banks closed, people with money for investment were few. That is why the price was low, and why prices of stocks were almost at the lowest level they have ever reached.

As a general proposition it may be said that prices are regarded as low enough when wheat can be sold freely for export.

An important price influence is the "next crop." Its shadow is cast a long way ahead, whether the crop is growing in our own Southwest or the Northwest, in Argentina, India or Russia. Speaking in a general way, by the last of January or first of February the old and the new crop influences are evenly balanced. Prospects for good crops of winter wheat during March, April and May depress prices of all the old wheat, while unfavorable conditions for the next crop increase the price and the value of the old wheat. Likewise, a large or a small surplus from the last crop has its influence on the next-crop prices.

But to attempt to say why prices average low or high for a series of years, would be equal to the task of explaining why one season is wet and another dry, or why there may be seven lean years followed by seven fat ones. Different people would have different theories.

It is somtimes innocently said that supply and demand make the price. This is true, of course, within certain limitations; but the legitimate supply and demand

only lay the foundation upon which the price rests. Prices have been low when the demand was exceedingly strong, while high prices have ruled when the supply was more than ample.

If the farmer sold his wheat to the miller, and there were no great storage elevators, no great markets, no exchanges and no trading in futures, then the price situation would be clear. Supply and demand would not only make the price, but would maintain it at around 50 cents a bushel to the farmer, except in the event of a crop shortage.

During the last five years, or since 1903, the tendency of wheat prices, or rather the price basis, has been upward, aside from the extreme advances caused by crop calamities and speculation. This has suggested to many that the world's production of wheat is perhaps overtaking the consumption—that the demand has become rather more pressing than the supply.

This is not probable nor does the theory, if it can be called such, satisfactorily account for the somewhat higher value of wheat than obtained some years ago. The advance in values has by no means been confined to any one commodity. It is general, and therefore there must be a common basic influence. According to the price tables of the commercial agencies the average price of commodities has advanced 50 per cent. in the last ten years.

In England the average advance has been approximately 35 per cent. The greater advance in the United States is by some writers in part credited to the tariff, while speculation unquestionably is accountable for some of the difference.

The advance of 35 per cent. in the price of com-

modities in England and a proportionte advance in the United States is ascribed to the depreciation of gold, as a result of a greatly increased production. One financial writer says: "Because of the rapidly increasing supply of monetary gold (from about $3,624,000,000, in 1887, to about $6,750,000,000 in 1907) its value is rapidly depreciating. This is seen,—and can be seen in no other way,—by the advancing price of the things for which gold is exchanged."

And yet, owing to the great variation in the size of the crops from year to year, and to extreme speculative influences at times, the advance in the price of wheat due to gold depreciation cannot be measured so readily as in other commodities. It is certain, however, that the average advance from this cause has not been 35 per cent. In 1906 the world had a record crop, and the price of May wheat in Chicago averaged 78 cents from September 1st to April 30th following. In 1907 the world had a short crop, and wheat in Chicago from September 1st to December 31st averaged close to a dollar. It is not probable that the average price of wheat in Chicago will be much under 85 cents for several seasons to come. It never should be below 75 cents on the farm in North Dakota.

There are various factors always at work in the wheat market, the influence of which can be measured with approximate correctness. Yet the factor of greatest influence in changing prices is also the most difficult to gauge. That is, speculation; but what constitutes speculation is variously interpreted. But without question speculation of one form or another has more to do with changing prices than any other factor, or than all others combined. This is also true of the stock market, where

dividends should be the measure of values. For instance, wheat is no more worth $1.25 under any conditions that have obtained in the last score of years than a 7 per cent. stock is worth 200, or a 4 per cent. stock is worth 150. Seldom is wheat above $1 on its merits, and never is a 7 per cent. stock worth over 150.

Prices are sometimes held far above a legitimate price level for months at a time by some powerful speculator. Under such conditions it is sometimes thought that the price represents actual value because it is maintained. A notable example was the price of May wheat from October, 1904, to April, 1905. The price was held above $1.08, and advanced to $1.21⅛ in February, 1905. But in April, when the great speculator who had controlled the market sold out, the price broke to 87 cents. During all the months the price was so high, averaging probably $1.13, the actual value of wheat was not more than 95 cents.

It is a peculiar characteristic of speculation that its first influence is almost always upward; its tendency is toward advancing prices rather than depressing them. There always is, however, a decline after an artificial advance.

The process of speculation as connected with manipulation is like that of caricature—it has something real to work on, but everything unusual, irregular or abnormal is played upon and exaggerated. If the victim of the caricaturist wears his hair somewhat longer than the commercial cut, he will always be made to appear with waving locks; and if he wears a beard, it is made the most prominent feature of the picture; or, if he happens to be a wealthy man, his clothes will be dotted over with $ marks.

So it is with the market manipulator. He will see disaster in rain or drouth, while every insect will be advertised as a menace to the crop no matter at what season it may appear. Blight, rust, frost, rain or drouth, a season too early or too late; war, strikes or famine are all used with the most sensational embellishments. A famine in some remote part of Russia, even though there is distress there every year, is made to appear as a reason for advancing prices. And a few bugs in the Kansas wheat fields are used to create an international crop scare! These are some of the methods used in "the grosser forms of gambling" in wheat, and which are deplored by the men who transact a legitimate grain business.

Trading in "futures," i. e., buying and selling wheat that is deliverable in some future month; as May, July, September or December, is done on a margin basis—depositing a margin of a few cents a bushel on all the grain bought or sold.

Short selling probably has no effect whatever on the average price of wheat, for it is equalized by "long" buying; and the latter is just as likely to be aggressive as the former.

Trading in futures is the result of a demand for a safer method of handling grain than merely to buy it to hold until used or resold, as one might deal in lumber. The first future-trading was doubtless for actual delivery of grain, as two men might contract with each other for the transfer of a certain amount of wheat at a specified time. This, of course, was inadequate, as such a market is narrow. Development from this point was easy and rapid, and rules were made to govern such transactions.

"Hedging" is selling wheat in the pit for May, July, September or December delivery, as the case may be,

against wheat actually owned. Yet as a matter of fact, comparatively little wheat is ever delivered on such contracts. The wheat itself is usually sold to millers or exporters and the hedge bought back in the pit; or, if the wheat is not sold, the hedge may be changed over to a more distant delivery month. Sometimes wheat is thus carried in the great elevators in Chicago for two years or more.

The future markets, in fact, serve the purpose of protecting grain handlers and millers. An elevator company buys wheat in the country and promptly sells as much in the pit, thus guarding against loss, no matter what may be the price fluctuations. This wheat may be held in the country houses or shipped to some terminal elevator and there stored. It may be held for months, or sold to some mill or terminal elevator company within a short time. When sold, however, the hedge will be bought back in the pit. Yet the wheat will be sold again in the pit by the terminal elevator or the miller who buys it, unless the latter grinds it at once. The future market affords protection to the millers, as they are enabled to buy wheat against sales of flour. Then, as the actual wheat is bought, the future that was bought in the pit is sold. Sometimes the millers buy futures for the purpose of having the actual wheat delivered to them.

During the crop-moving period, when half the wheat crop of the country is marketed in ninety days, the future markets become a real benefit to the farmer, and they are particularly important in the price system at that time.

One of the reasons why the farmer is benefited is because it makes little difference to the elevator companies or the millers whether the price is high or low. They do not try to buy the wheat as cheaply as possible,

for their profit is not made that way. The wheat they buy in the country today is bought at a certain margin under the market price. They immediately sell the wheat for future delivery. Their profit is therefore secured at once, and they have no interest in the price, whether it advance or decline.

Without a future market, the elevator companies and the millers would have no way to protect themselves against loss. The elevator companies could not possibly sell to millers or exporters all the wheat they could buy from day to day when the farmers were selling freely. This would result in every one trying to buy wheat at such a low price that it could not decline much further. During the crop-moving period the price would be at a level where elevator companies, millers and speculators would feel safe in investing their money. It is clearly to be seen that the farmer would have the worst of the price argument.

The buying of wheat would thus be entirely a speculative proposition. The "floor trader" (the scalper) would have been eliminated, and speculation transferred from the exchanges to the railroad stations; gambling in the farmer's wheat substituted for trading in futures. Illustrations of grain buying under such conditions are found in Russia.

If speculation could be eliminated from the grain business, no doubt the markets would be raised to a little higher moral tone. Yet so would every other line of business activity, commercial or financial.

The part that speculation plays in the market is all the way from beneficial as a price influence to temporarily disastrous. Big bull markets are demoralizing to the grain and milling business, though exceedingly profitable

to the farmer. Comparatively few people in the trade welcome such markets, but they are unavoidable, just as an occasional cyclone is beyond the control of the weather bureau. Bull markets are the result of certain unusual or abnormal conditions, in which human nature takes the leading part. They would be possible without future markets and without margin trading, as was witnessed in all the markets of Europe in 1907. They could be made less frequent, however, and their force tempered by wise and courageous action on the part of the directors of the grain exchanges.

MAY WHEAT STATISTICS.

The following table, compiled by Howard, Bartels & Co., Chicago, shows the high and low prices for May wheat for a series of seasons, giving the opening and the months in which high and low prices were reached:

Season.	Opening.	High.		Low.	
1907-8	$1.06¾	$1.12⅝	Oct. 1907	89¼	April 1908
1906-7	84¼	1.00¼	May 1907	74⅝	Mar. 1907
1905-6	83	92⅞	July 1905	76¼	Mar. 1906
1904-5	82⅛	1.21½	Feb. 1905	81¾	June 1904
1903-4	76½	1.09	Feb. 1904	76	Nov. 1903
1902-3	77¼	82¾	Jan. 1903	68½	Aug. 1902
1901-2	74½	84¾	Mar. 1902	70½	Jan. 1902
1900-1	81	81⅜	Oct. 1900	69⅝	April 1901
1899-0	78⅝	79	July 1899	63½	May 1900
1898-9	71	79½	Jan. 1899	62⅜	Sept. 1898
1897-8	77	1.85	May 1898	77	July 1897
1896-7	64½	85⅞	Nov. 1896	61½	Sept. 1896
1895-6	72½	78	July 1895	56⅞	Dec. 1895
1894-5	60½	81⅜	May 1895	52	Jan. 1895
1893-4	76⅜	80¾	Sept. 1893	52⅞	May 1894
1892-3	85⅞	90	April 1893	68¼	May 1893
1891-2	1.07½	1.18½	Aug. 1891	77½	April 1892
1890-1	94¾	1.16	April 1891	92½	July 1890

CHAPTER III.

MONEY FOR MOVING THE CROPS IN AMERICA.

Currency for the Farmer—Annual Drain on Business—East Protests and West Boasts—Early Southwestern Movement —Northwestern Crop Greatest Financing Problem in the World—"Line" and "Terminal" Elevator Companies— —Grain Paper—Warehouse Receipts—Northwest a Large Buyer of Grain Paper—Commercial Paper Brokers—Wheat States Less Dependent on East.

It is now a well-established custom throughout America and Canada to pay the farmer in cash for his grain. The practice is carried so far that many mills in the West now buy the farmer's wheat outright, and sell him his flour, instead of doing an "exchange" business. In the three months of June, July and August the United States harvests a billion and three-quarters bushels of grain, more than one-third of which is wheat. The grain begins to move to market promptly, and grain buyers, elevator owners and millers must be provided with money in anticipation of the movement. The same situation obtains in the South when the cotton crop is gathered.

Every year, therefore, the financial interests of the country, and particularly those of the East, are somewhat strained by reason of the withdrawal of currency from other channels of trade. During the last few years the East has perhaps come to look too much upon the currency of the country as its own. At any rate, it absorbs it and by the spring of every year is utilizing currency drawn from every banking center east of the Rocky Mountains. Business is then going on so smoothly that

there is a protest against distributing currency throughout the West for moving the crops. The annual grumble of the East, however, is only on a par with the periodical pre-harvest boast of the West that it can finance its crops without the aid of the East. Yet every season after the East has made its usual protest, it returns part of the money it has received from Western banks, and loans some more besides; while the West, after its little boast, looks forward eagerly for the Eastern help, which it knows will surely come. The farmer, meanwhile, complacently prepares for the harvest; and when his grain is ready for market, hauls it to the nearest railroad station, absolutely confident that the local grain buyer is waiting for him with the ready money.

With a fair crop and high prices, of which the crop season of 1907 was a striking example, the amount of money required to move the grain and to finance the supplies in store is vastly greater than usual. The withdrawal of an extraordinary amount of currency from other parts of the country at a time, too, when every dollar is employed and needed, causes more than inconvenience. It is a commercial hardship. The extent of the hardship depends upon how the banks in the central reserve cities have loaned their money; how much paper Western banks have bought in New York, how much of the country's reserves New York has absorbed, and whether those who have borrowed the money can pay it back as demanded. In the fall of 1907, it was found that many borrowers had money tied up in business enterprises, while others had traded too heavily in stocks and could borrow no more to cancel their first obligation.

In the Central states, owing to smaller wheat crops, and to denser population and correspondingly greater

wealth, financing the crops does not call for such an amount of currency as it does in the West—Minnesota, the Dakotas, Nebraska, Kansas and Oklahoma. The wheat crop of these states is 300,000,000 to 350,000,000 bushels, or half the total production of the country. Added to this there is in Minnesota and the Dakotas a barley crop of approximately 70,000,000, and 28,000,000 of flaxseed. Oats require less money to handle, although the crop is an important factor, moving at a time when money is in great demand.

Harvest coming in June in Kansas and Oklahoma, the first demand for currency is from that direction. This is particularly fortunate, from a financial point of view. For there is always a demand from Europe for the new hard winter wheat grown in the Southwest, and a demand for the wheat and flour in the East. Foreign and domestic drafts against wheat and flour shipments therefore quickly find their way to New York, and very soon, also, currency begins to flow back from the wheat fields, after having served its purpose of starting the crop. By the time the first movement of the Northwestern crop has exhausted local resources, the Southwestern crop movement is in full swing and is moving easily. Currency has completed the circle and is being diverted toward the Northwest, or to the banks of Chicago for financing the accumulating stocks of grain in elevators there.

Furnishing money for moving the crops of the Northwest is probably one of the best examples of financing to be found in the whole commercial world. And it is only possible because the system is of gradual development and by reason of its regular recurrence, and because the bankers east of the Mississippi know that it must be done. The money must be on hand as surely as that

which is required in New York on January 1st with which to pay dividends.

It is impossible to more than roughly estimate the vast amount of money that must be withdrawn from other channels in order that the farmer may receive his annual cash dividend from his land. It may be said that the amount required in the Northwest to move the crop and to carry grain in store to January 1st, is approximately $100,000,000, varying largely according to the price of grain, of course. This is intended to represent only the amount of currency and not of credit, annually diverted from other lines of business, and that local banks and the East are called upon to supply. Of course, a much larger amount is called into temporary use.

Certain conditions obtain in Minnesota that cause an unusual centralization of interests. If it were not for this fact the demand for currency would be much less acute, and the time of its confinement in the Northwest would be shortened. Of course, the big crops of Minnesota and the Dakotas call for a great amount of money. But Minnesota is a milling state, and an immense amount of wheat is required within its borders. Minnesota mills, including Minneapolis and Duluth, grind approximately 120,000,000 bushels of wheat annually.

Now in order to insure the mills getting sufficient wheat—to keep it from being drawn to other markets—it must be purchased as offered and stored in elevators in the country or at Minneapolis and Duluth until ground. This results in concentrating and tying up a large amount of money every fall in the Northwest which would otherwise be distributed over a greater area. Owing to the centralization of milling interests in Minnesota and to the immense crops of the three Northwestern states, the

demand for currency every fall from this region has not a parallel in the world's grain trade.

A system of borrowing money for financing the business of handling grain has come by way of evolution; and the most important factor in the system is credit. The rest is largely mechanical. Besides the millers, there are two classes of borrowers, namely, the elevator companies and the commission houses. The latter finance grain buyers at country stations, and they are given lines of credit by their bankers in Minneapolis and Duluth.

The heavy borrowers are the elevator companies, and these are divided in two classes, the "line" and the "terminal" elevator companies. The former have a "line" of small elevators at country stations or towns, usually on one system of railroad. The number of such elevators owned by one company is from a dozen to over 100, and they may extend through two or three states. Some Minneapolis companies own lines in Kansas (with headquarters in Kansas City), Nebraska, Iowa, North and South Dakota and Minnesota.

The "terminal" elevator companies own the immense storage elevators—silos, they are called in Europe —at Minneapolis, Duluth, Chicago and other centers.

The business of the two classes of companies is different. The line elevator company buys grain directly from the farmer, and ships it to the centers and sells it to terminal companies or to millers. Some wheat is sold to country mills and so never reaches the centers. The terminal companies buy wheat and other grain from the line companies and the commission houses, to store for a time. But, of course, the grain is ultimately resold, the wheat to millers locally or farther east;—Duluth also sells to exporters and direct to Europe;—flaxseed is sold

to oil mills, and barley to malsters, while oats are sold for shipment to various points between the Mississippi and the Atlantic seaboard.

The elevator companies have large resources of their own; yet they borrow great amounts on their unsecured notes. The local banks extend them a line of credit in proportion to their size and standing. The amount that can be borrowed of course depends on the character of the borrower and the statement of his business that he can show. The companies also borrow on the grain in their houses, offering as collateral warehouse receipts. Of course, unless the elevators are of fireproof construction, the contents are insured.

When the elevator companies have exhausted their credit at their local banks and in the East—for the larger companies are borrowers in New York—their paper, "grain paper," it is called, is then offered through commercial-paper brokers to bankers generally who are likely to be in the market. Canadian banks have for years been good buyers of grain paper.

Grain paper has, during the last five years, steadily grown in favor among bankers generally as a short-time loan for their surplus funds. This is, of course, partly due to increased deposits of banks, but not altogether; for many banks now turn to the Northwest in the fall for grain paper that formerly never bought it even when having money to loan. Country banks are now, in the aggregate, heavy buyers of this paper in the fall, though the amounts taken by individual banks are necessarily small. The banks of Iowa, Minnesota, the Dakotas and even Montana have become regular buyers. It was estimated that during the crop-moving period of 1907 the banks of the Northwest bought $40,000,000 of grain

paper in Minneapolis. Montana banks have increased their purchases from year to year of late; and they are well equipped for buying grain paper, as they get the money from the sale of wool in August.

Grain paper is sold to banks in the smaller cities and the towns by brokers and also by the Minneapolis, St. Paul and Duluth banks. A few of the big elevator companies negotiate part of their own paper.

The paper of the terminal elevator companies, secured by warehouse receipts, is regarded as the most desirable that can be had; and seldom has there been a time when there has not been a market for this and also for the paper of the line companies that have had a long and successful career. New York banks at times buy this paper even when they can obtain higher rates on stock market collateral at higher rates. At one time a New York bank bought several million dollars of short-time terminal elevator paper at 5 per cent. when money was 10 per cent. in New York. The factor that makes this class of paper so desirable is, of course, the grain that is the basis for the loan. Wheat can always readily be converted into money.

CHAPTER IV.

PANICS AND THEIR EFFECT ON FINANCING THE CROPS.

Money in 1893—Gold Notes in 1896—Currency Locked Up in November, 1907—Farmers Sell No Grain for Two Weeks —Check System Devised—Western Money in New York —Wall Street Absorbs Too Much of Country's Money— Greater Percentage of Western Money Will Stay in West —Wheat Prices and Panics—1907 Compared With 1893— Wealth of Western Wheat States.

It is inevitable that panics or general business depression should make it difficult for the banks to furnish money for moving the wheat crop and for storing grain. The effect of money disturbances, if general, is therefore reflected in the price of grain. New York, or Wall Street, the great money center, may have a panic which, if not of long duration,—as, for instance, that of 1903,—may not seriously inconvenience the West. But the panics of 1893 and 1907, and the money scare of 1896 were demoralizing in their effect on prices and on the entire system of grain handling.

During the fall of 1893, some of the elevator companies had no great difficulty in borrowing money. Others could not borrow at all. It depended on the standing of the company, the statement of its condition it could show, and the connections it had in the East and in Canada. The banks of Toronto and Montreal bought large amounts of grain paper and were influential in aiding to move the crop. The stringency was so great, however, that prices were depressed and the volume of business

greatly decreased, owing to the slowness of the crop movement.

Yet the manager of one of the largest elevator companies in the country told the writer that his company made more money—that is, relative to the capital invested—during the season of 1893-4 than in any other year of its business career. This was due to its ability to borrow money and thereby take advantage of the opportunity offered by low prices and a big carrying charge. The low prices enabled the companies to handle a relatively greater amount of wheat than usual, while the business depression forced the price of the actual wheat so far below the futures that a large profit was assured to any elevator owner who had working capital.

During the money scare of the summer and early fall of 1896—the free silver campaign—it was for a time impossible to borrow money, except on gold notes; that is, payable in gold. The experience of one of the largest elevator companies, one whose standing is the very highest, will give an idea of the effect that the scare had on financing the crops.

This company had been able to borrow some money until October, when no more could be had in this country. Negotiations were opened with a Canadian bank, and $50,000 could be had, at the rate of 10 per cent., on gold notes. But the difficulty was to guaranty payment in gold with any feeling of security; for if the democratic party should elect its candidate, gold would be practically unobtainable. The elevator company, however, found a money broker in New York who would sell a call on $50,000 in gold for $1,500. The company closed with him, and then had the transaction insured by a New York trust company. Loaning money at that time with-

out demanding a gold note was in reality a bet that the democratic presidential ticket would be defeated. Immediately after the election the money scare of course subsided, and the moving of the crops was done under normal conditions. General business was then improving as rapidly as it was declining in 1893.

In the fall of 1907, due to money troubles in large part brought about by a phenomenal decline in Stock Exchange securities, it became impossible for the banks of New York to make further shipments of currency. This decision was arrived at on October 28th, and it of course compelled the banks of other central reserve cities to also refuse to ship currency, and the banks of the smaller cities could only follow. It was then a case of every city for itself. The following is a copy of a circular issued by the banks of a Western city on October 28th, 1907:

In view of the action of the banks in the central reserve cities of New York, Chicago and St. Louis in refusing to ship money against balances due us, be it resolved,

That for the protection of our commercial interests, and for the purpose of preventing a drain of money from the banks, the banks and bankers of Minneapolis, St. Paul and Duluth do hereby agree to adopt substantially the plan recently adopted in New York, Chicago, St. Louis, Pittsburg, Milwaukee, Indianapolis, Des Moines and other cities, viz.,

That we will not pay out money on checks, certificates of deposit or drafts, except for small sums, and that for the present no money will be furnished to bank correspondents; but we will certify checks on balances in our hands payable through our clearing houses only. The savings banks and trust companies and the savings departments of banks having such departments, will require the sixty and ninety-day notice to which they are entitled by law.

When it is realized that 93 per cent of the business of the country is transacted by means of checks, and only 7 per cent by means of money, it will be readily seen how little inconvenience will be caused to the business community by the plan adopted by the associated banks. The payment of checks and drafts through the clearing house will proceed in the usual way through the regular channels. These checks and drafts may be deposited in the banks as heretofore, and their protection has been fully provided for by this action.

This occurred in the height of the crop-moving season in the Northwest and while the winter wheat movement was still large.

The effect was instantaneous and the result was an unprecedented incident in commercial history. On October 28th and for the following two weeks the great elevator companies having thousands of agents throughout the West, did not buy a bushel of grain from the farmers. They received grain for storage, however. Some individual dealers bought limited amounts of grain, but the marketing of the crop was practically brought to a standstill. Grain in country elevators was sent forward as usual to the centers, Duluth, Minneapolis, Kansas City, St. Louis and Chicago.

The moral effect on the West of the remarkable situation existing was slight. Naturally, the bankers in the cities were apprehensive. But the farmers and the people of the small towns regarded the tie-up of the currency of the country as they might an eclipse of the sun—a phenomenon; a temporary inconvenience, but something over which they had no control and with which they were not greatly concerned. The calamity, if such it can be termed, was so great that it could not be comprehended, and therefore its ultimate effect was not taken into ac-

count. And why should it be? for the farmers were wealthy and the country prosperous.

But the grain trade fully realized what a financial crisis accentuated by a general tying up of currency meant. At the least it meant a season without profits. Money was not only hard to get, but practically impossible to borrow, during November and December, even on warehouse receipts representing No. 1 northern wheat; and there is no better collateral in the world.

This resulted in the line elevator companies shipping the grain freely from their country houses and selling it in the exchanges. They could not sell it for future delivery and store it for the profit which might arise from such a transaction. The banks would not loan money for such purposes. The millers and the terminal elevator companies were enabled to finance some wheat stocks; for this was a necessary part of the commercial machinery which must be kept going.

Rates of interest were, of course, high during the panic period. Up to the crisis the rate on grain paper was 7 per cent. for four to six months— a very high rate. During November and December renewals to terminal elevator companies by the banks was at 7 per cent. and for new loans 7½ per cent. This was for loans secured by terminal receipts. On unsecured notes—on the very best two-name paper in the grain trade—the rate paid was 8 to 9 per cent. for time money. Borrowers of lesser standing paid as high as 10 per cent.

Full currency payment was resumed by Minneapolis and St. Paul banks on December 23rd, before New York and Chicago had decided to make such a move. This action on the part of the Northwestern banks was another indication of the remarkable growth of the wheat states

since the panic of 1893. Some comparative figures of bank deposits of the Western states are given in the closing paragraphs of this chapter.

The money panic of November, 1907; the suspension of currency payment throughout the country and the hoarding of currency by individuals and by banks; the business depression, the check on all railroad and industrial expansion; the closing of factories, the laying-off of half a million employees, and a general reduction of wages and salaries—all this when the country was in the midst of prosperity, has taught its lesson to the banking interests. The panic was a Wall Street panic, and the suspension of currency payment was a Wall Street necessity to prevent annihilation.

All this has a direct bearing on the grain business and on the annual financing of the crops. The reserves from the great wealth of the West, because of the money trouble which originated in New York, will be kept more largely in the West. New York, of course, will continue to be the great financial center, but the importance of the small centers of the West, such as Minneapolis, St. Paul, Omaha and Kansas City will be distinctly advanced.

The increasing wealth of the West during the last few years has given the banks great deposits. This has resulted in much money being loaned in the East by the purchase of commercial and Stock Exchange paper at certain seasons; for during the spring and early summer months money accumulates in the West; or, rather, it would if it were not sent to the East. Owing to the approaching crop-moving period, very large amounts must be kept idle or loaned on call, with the absolute certainty that currency can be had when demanded. The autumn

of 1907 demonstrated that the East cannot be depended on to return borrowed money when wanted; that is, if too great a percentage of the new wealth of the West is loaned in the East. When New York absorbs money freely from other parts of the country, now that there is so much more wealth outside of New York than a few years ago; when money is loaned in the financial center because of high rates of interest there, it is a menace to the rest of the country. For, obstruct the easy return flow of currency to channels from which it was intended to be drawn but temporarily, and embarrassment follows such as that experienced in November, 1907.

It stands to reason, therefore, that the banks of the West will never again permit so great a percentage of their reserves to find their way to New York. And this must inevitably mean the development of the smaller financial centers of the West.

The question is frequently asked, Why does a money disturbance affect the price of wheat? The first effect is entirely due to psychical conditions. That is, it is generally believed that prices will decline; therefore, the grain trade acts accordingly. Those who have bought for speculative purposes or investment sell out their lines, while speculators sell wheat short in anticipation of a decline. Instead of looking upon wheat hopefully, as something worth the price and likely to advance, a directly opposite view is taken by every one who has anything to do with grain. Prices are regarded with suspicion. This is the first stage of money stringency or a panic in the grain trade.

The second stage is when the elevator owner, the grain buyer, the miller and the flour buyer find difficulty in getting money to transact business in a normal way.

Then, too, an additional element of risk enters into all business transactions during a time of financial troubles; and the result is that a little wider margin is demanded by grain buyer, by miller and by flour jobber. This all tends to depress the price of the raw material, wheat. The producer is made to suffer for the financial sins of the commercial world, though a little more indirectly than employees are made to suffer for the errors of employers, by losing their positions or having their wages or salaries reduced.

It is perhaps one of the marvels of modern business ethics that taking advantage of general business depression—a panic period—to sell wheat short and so influence a decline in prices, is not regarded with disfavor. Some time it will be looked upon as a business crime. Yet at the present time it is not given a thought. It was common talk in speculative grain trade circles in November and December of 1907 that many had sold wheat short because of the financial conditions. Some prominent brokerage houses repeatedly advised their customers to operate on the short side, while some houses with Wall Street connections had heavy short accounts on the Chicago Board of Trade.

In this respect commercial ethics are somewhat lacking. Yet during the November panic of 1907 short selling of stocks on the New York Stock Exchange was prevented by the banks, who refused to loan on stocks. And as short sellers must borrow stocks to deliver on sales, the action of the banks checked such trading. This was hardly due to any greater degree of business morality, however, than that of the members of the Board of Trade. It was done to prevent prices of securities from going still lower and so causing greater financial stress with

resulting widespread disaster. In fact, the short sellers might have brought ruin upon themselves, although wealthy with paper profits. For by depressing prices still further the houses buying the securities might have been unable to meet their obligations. Such instances have occurred.

The money panic of 1907 began on October 22nd, and its effect on wheat prices was decisive. Yet a week before the culmination of the trouble in New York there was uncertainty enough in the situation to start a decline in grain prices.

Prices were very high and had been advancing for two months. Chicago December wheat sold at $1.07⅝ the middle of October, due mainly to a world's shortage of wheat and sensationally strong European markets. Very high prices were predicted, and wheat would probably have sold at $1.25 but for the panic. From the middle of October to November 9th wheat in Chicago declined 16 cents, and this in the face of one of the strongest situations, based on demand and prospective supply, that has ever existed. Such is the effect of a panic on wheat prices.

Another result of money stringency is to depress prices of the nearest futures more than the distant ones. For instance, during the most acute stage of the 1907 panic, Chicago December wheat sold 8 to 9¾ cents under the May future. That is, the carrying charge from December to May was 8 to 9¾ cents. This is extreme, and it is a condition that could never obtain but for tight money and high interest rates. Under ordinary conditions it is not worth 8 to 9 cents to carry wheat in the elevators from December to May. There is a big profit

in it for the elevator companies, if they can finance a large amount of grain.

How much prices may decline or how long they may remain at a relatively low level depends on many things. That they did not decline further in November or December of 1907 was due to two factors. One was the relatively high prices in Europe, combined with the export demand which sprang up on the decline, and the other was a wealthy and powerful speculative grain commission house in Chicago. This house supported the market by buying enormous amounts in the pit.

When prices during the depression of 1907 are compared with those of 1893 to 1896, there is a seeming inconsistency in panic prices. Yet it must be remembered that the money stringency of October and November, 1907, not only caused a decline of 16 cents in the Chicago market but prevented an advance of probably 20 cents; the effect was therefore equal to somewhat over a 30-cent decline. Furthermore, the market was supported by big speculators.

The general business conditions of the country should be borne in mind. Low prices of 1893-6 were the result of a general business collapse; and, too, the heaviest speculators operated on the bear side.

The 1893 panic started in July, and this was the beginning of a long period of business depression and of very low prices. In November Chicago May wheat sold under 70 cents, and from January 1st, 1894, to the following May the range of prices was 68⅜ cents as high point to 52⅞ cents as low point. For the two years following prices were also very low. In January, 1895, May wheat sold at 52 cents and did not sell above 60 cents until the following May.

But let us compare the condition of the country during and following the panic of 1893, with that of 1907.

In 1893 the West was heavily in debt to the East for money borrowed to build its cities and to develop its farm lands. Every dollar that the West made was sent to the East to pay interest. The Western states were but partly developed, and there was no local capital to aid in financing enterprises. The collapse of a real estate boom in which millions of dollars of Eastern money was lost revealed the fact that many Western banks were heavily involved by reason of real estate speculation.

When the day of reckoning came, beginning with July, 1893, banks began to go down all over the country like haycocks in a summer's gale. The number of failures was over 400. Manufacturers and merchants failed by the thousand, while railroads, great and small, went into the hands of receivers to such an extent as to jar the financial world. Forty-five railroads succumbed in the great panic. Moreover, the farmers of the West were poor, and the agricultural states were mortgage-ridden.

In 1907 there were failures of commercial houses, of course, but comparatively few, while bank failures were rare. Manufacturers and mine owners reduced the output of their factories and mines and half a million people were thrown out of employment. Yet the agricultural states were exceedingly prosperous, due to three seasons of fair crops and high prices. Furthermore, the Western states had developed remarkably, increasing greatly in population and in wealth that belonged within their borders. Thousands of country banks had large deposits. Under such conditions there could not be such extreme depression as followed the panic of 1893.

Some idea of the great change in the Western wheat

states since 1893 may be had by considering the bank deposits. In the Dakotas deposits were approximately ten times as great in the early summer of 1907 as they were in the summer of 1893. In Minnesota over four times as great; in Nebraska four times as great and in Kansas five times. Furthermore, many banks failed during the late summer and fall of 1893, wiping out their deposits entirely. In 1907 there were almost no failures and the banks were sound.

Another feature of the greater substantial condition of the wheat states in 1907 was the relatively smaller number of banks. Minneapolis, for example, with a population of 300,000 in 1907, had 17 banks, two of which were savings institutions and four of the others were new ones. The deposits of the national and state banks amounted to $53,500,000, and of the savings banks $17,350,000. This was in August. In July, 1893, with a population little more than half so great, the city had 26 banks, including two savings banks. The total deposits of 24 amounted to $16,750,000, and of the two savings banks, $7,250,000.

The total deposits of all banks in Minnesota in June, 1907, amounted to $235,000,000. In 1900 the total was $110,843,000, while in 1893 it was, of course, much smaller.

The total deposits in North Dakota in June, 1907, amounted to $50,000,000. South Dakota had on deposit in June, 1907, $33,157,000, as compared with $3,480,000 in 1893.

Iowa had in its state and savings banks and trust companies, in April 1907, $209,441,000, as compared with $42,151,000 in 1893.

Nebraska banks had on deposit in June, 1907, $65,300,000, as compared with $18,446,000 in 1893.

Kansas, some seasons the greatest wheat-producing state in the Union, had in its banks $165,889,000 in June, 1907, as compared with $33,268,000 in June, 1893.

Thus the combined deposits of the five great wheat states of the West, Minnesota, the Dakotas, Nebraska and Kansas, amounted to approximately $550,000,000 in June, 1907.

This great wealth, which has come within a few years, changes the position and importance of the West in the general financial scheme of the country. As yet the West is not a financier; it is a composite, a farmer-merchant-banker. It has not yet learned how to handle so much money. But it can safely be assumed that an increasing percentage of it will each year be available to aid in financing the crops, and that a decreasing percentage will find its way to Wall Street.

CHAPTER V.

THE CHICAGO BOARD OF TRADE.

CHICAGO annually receives 25 to 50 million bushels of wheat and a total of 240 to 300 million bushels of all grain; and so it is the greatest grain center in the world: but this is only a small part of the market, for the total of the transactions in wheat during the year exceeds the crop of the country, and to this is added several hundred million bushels for corn and oats. And so, while there are other important markets, and while Liverpool and London are the centers toward which the world's surplus of wheat is drawn, Chicago has no rival; and none other even aspires to second place.

But how is it possible to transact such an enormous business in wheat? Just as it is possible for the bank clearings of the clearing-house cities of America to amount to 100 billion dollars a year, while the total stock of money of the country (including gold coin, gold certificates, silver and silver certificates, treasury notes, U. S. notes and national bank notes) is but a little more than three billion dollars. Just as it was possible for the clearings—the transfer of checks in the clearing houses—to amount to three billion dollars in one week in 1907, a total almost equal to the entire stock of money in the country. As the purchasing power of actual money is not affected by this enormous exchange of credits, neither is the value of wheat depreciated by this equally enormous set-off of contracts.

Chicago is the central wheat market of the world;

and it is a central market because there are enough dealers there so that wheat in any quantity can always be bought or sold. And it is no more necessary to ship wheat there to deliver on every sale, nor to take wheat on every purchase, or to deliver or take a warehouse receipt, than it is necessary for one bank to send to another bank with checks drawn on the latter and demand the currency. Contracts may "set off" other contracts, the same as checks and drafts set off other checks and drafts. The Supreme Court of the United States holds that "set-off has all the effects of delivery."

In a decision on May 8th, 1905, the Supreme Court said:

When the Chicago Board of Trade was incorporated we cannot doubt that it was expected to afford a market for future as well as present sales, with the necessary incidents of such a market, and while the State of Illinois allows that charter to stand, we cannot believe that the pits, merely as places where future sales are made, are forbidden by the law. But again, the contracts made in the pits are contracts between the members. We must suppose that from the beginning as now, if a member had a contract with another member to buy a certain amount of wheat at a certain time and another to sell the same amount at the same time, it would be deemed unnecessary to exchange warehouse receipts. We must suppose that then as now, a settlement would be made by the payment of differences, after the analogy of a clearing house. This naturally would take place no less that the contracts were made in good faith for actual delivery, since the result of actual delivery would be to leave the parties just where they were before. Set-off has all the effects of delivery. The ring settlement is simply a more complex case of the same kind. These settlements would be frequent, as the number of persons buying and selling was comparatively small.

The fact that contracts are satisfied in this way by set-off and the payment of differences detracts in no degree from the good faith of the parties, and if the parties know when they make such contracts that they are very likely to have a chance to satisfy them in that way and intend to make use of it, that fact is perfectly consistent with a serious business purpose and an intent that the contract shall mean what it says.

The Chicago Board of Trade and the Chicago market are not the same thing; for the Board of Trade has no more interest in the market than "Lloyd's" of London has in the placing of insurance. The latter supplies a place in the Royal Exchange for the insurance agents to meet and transact business. The Board of Trade, a corporation, supplies an exchange room where its members may transact their business, and it makes rules and enforces them. The original objects of the organization were thus defined: To maintain a commercial exchange; to promote uniformity in the customs and usages of merchants; to inculcate principles of justice and equity in trade; to facilitate the speedy adjustment of business disputes; to acquire and to disseminate valuable commercial and economic information; and, generally, to secure to its members the benefits of co-operation in the furtherance of their legitimate pursuits.

The Board of Trade was organized in 1848, incorporated in 1850, and in 1859 it received a special charter from the state of Illinois. The charter authorizes it "to establish such rules, regulations and by-laws for the management of their business, and the mode in which it shall be transacted, as they may think proper."

The membership of the Board of Trade includes some one from nearly every prominent grain commission and elevator company in the country, many of the big

millers, some of the New York Stock Exchange members, some European importers, and, of course, several hundred local grain commission men, elevator managers, brokers, several capitalists, several bankers, and owners and representatives of the packing houses. The number of members is between 1,700 and 1,800, and the price of memberships depends upon the condition of business and the demand for them. Memberships sold as high as $4,400 in 1882, and down to $475 in 1895; but the range during the last few years has been from $1,800 to $3,400.

AN ELEVATOR CENTER.

While Chicago is a great elevator center, in fact, having the greatest grain storage in the world, the statistics regarding it are rather misleading. For instance, it is sometimes stated by writers that the city has 79 or 80 elevators with a combined capacity of 60 to 70 million bushels. By the elevator capacity, the inference is, of course, that only houses used for receiving and shipping grain are included. Therefore, mill storage, which is really part of a mill, malting house storage, linseed oil mill storage, in fact, all storage that is not used for receiving and shipping, that is not really a factor in the grain-handling business, should be eliminated.

Eliminating such elevators from the list, there remain some 24 private elevators, with a capacity of approximately 21,000,000 bushels, that are really factors of the receiving and shipping business. There are also 14 public elevators, having a capacity of 23,000,000 bushels. This gives a total storage capacity of 44,000,000 bushels.

Chicago receives the larger part of its grain from the states to the southwest and west as far as Kansas and Nebraska, and north as far as southern Minnesota

and southern South Dakota. Yet there is a considerable volume of grain received by boats from up the lakes. During the lake season there is an immense shipping business in grain down the lakes.

The receiving and shipping business by the commission houses and the great elevator companies is on a scale greater than in any other market in the world. The great volume of this business is due to Chicago being, by its position, the natural corn and oat market of the country. The receipts of corn range from 75,000,000 to 125,000,000 bushels a year, though during a short crop season in 1902 they dropped to 51,000,000. The heaviest year was in 1900, when the receipts were 134,663,000 bushels. The yearly receipts of oats range from 75,000,000 to 110,000,000 bushels. The demand for wheat is so scattered, owing to the many mills throughout the wheat states and to there being other important centers, that Chicago does not get a great volume of wheat. The receipts during the last twenty years ran as low as 13,500,000 bushels, in 1888, and as high as 51,200,000, in 1901. Since 1897 the yearly receipts of wheat have averaged between 25,000,000 and 30,000,000 bushels.

Chicago is headquarters for many line elevator companies, some of which have lines of houses extending throughout the Central states, and west through Illinois, Iowa and Nebraska, and southwest through Kansas and Oklahoma. Much of the grain bought by the agents of these companies is never shipped to Chicago, but goes to mills, to other centers or perhaps to the Gulf for export.

THE MARKETS.

The grain houses of the Board of Trade are the terminal elevator companies, the line elevator companies, and

the commission companies—those that transact a cash grain business only, those that do both a cash grain and a future business, and those whose dealings are confined to the future markets; and then there are also the buyers for many interests.

The concentrated market interests of all these concerns with their many ramifications throughout the West and their connections in the East, in all other market centers and in other countries, focus here in Chicago, in the Board of Trade building, on the floor of the Exchange. This is the wheat-market center of the world; and here the country miller of Illinois, the grain buyer of Iowa, the elevator manager of any center, the big miller of Minneapolis, the terminal elevator company of Chicago, the exporter of New York, the exporter of Argentina, and the importer of London, Liverpool, Amsterdam or Antwerp—here they all come to buy or sell wheat as a hedge against legitimate transactions in their regular business activities. And to this center, to take advantage of the market machinery required in the conduct of the grain business, comes speculation; and at times its volume is very large.

All the business transacted in the Chicago market is done during the trading hours of the Exchange, or between 9:30 and 1:15. During these hours there is continuous activity; but after the closing hour the Exchange room is deserted.

The transactions on the Exchange come under two heads, though there are several sub-divisions, namely, "cash grain" business and "future" business.

Under cash grain business come all the transactions pertaining to receiving the actual grain—wheat, corn, oats, barley and rye—selling it by sample and shipping

or transferring to some elevator where it may be placed in store. The cash grain business is all conducted at one side of the Exchange room, where the salesmen come with their samples to meet the buyers for the local or out-of-town mills, buyers for the terminal elevator companies, and buyers for many other interests. Unlike many European exchanges buyers who are not members of the Board of Trade are not permitted to transact business on the floor themselves. They must employ a broker and pay a commission for his services.

The cash grain market of Chicago has not the appearance of activity of the "spot" market of Liverpool, Hamburg, Berlin or the cash grain market of Minneapolis.

But the market as a whole is a different matter. For the future markets with their four "pits,"—wheat, corn, oats and "provisions,"—during a busy time combine a scene of activity, intenseness, seriousness and often excitement that gives the impression of impending tragedy, and which is seen nowhere else excepting in the Stock Exchange in New York or in the Bourse of Paris. During a very active market the wheat pit is crowded with some 350 struggling, shrieking men endeavoring to execute their orders; and at such a time every one in the Exchange room seems to have a realizing sense of the importance of the momentous volume of business that is being done. It is a time when moments are valuable, and a few seconds suffice to complete transactions. This necessitates the greatest possible rapidity and alertness that human beings are capable of, physical and mental, and the aid of all the mechanical appliances that may be had. Orders are continually coming to the floor by telephone and by wire, and messengers, impressed

with the demand for speed, are delivering them. A large force of telegraph operators occupies one corner of the Exchange room. From the time the gong sounds at 9:30 until it announces the close at 1:15, when there is an active market, there is no time, no thought for anything but the business of the moment. What happened a minute ago is past, and that which is to be done a minute hence will be attended to when reached. There is a time limit on the transactions of the day, and whether the orders amount to 10 million bushels or 30 million, they must be executed before 1:15.

The unit for transactions in the pit is 5,000 bushels. When any broker offers to buy or sell at a stated price without mentioning the amount, it is understood that 5,000 bushels is intended. When a broker wishes to trade in a greater amount, he offers or bids for "10," "20," "50," or "100," as the case may be, meaning 10,000 or 100,000 bushels, or whatever amount is indicated. A trade of 10,000 bushels of wheat is approximately the equivalent of 100 shares of stock in the New York stock market: one cent fluctuation represents $100, the same as one point change in the price of a stock indicates $100 on 100 shares.

The "contract grades" of wheat, or the basis for transactions in the pit,—the wheat that is being bought and sold,—are No. 2 red winter wheat and No. 1 northern, but No. 2 hard winter may be delivered on contracts at 2 cents a bushel under the contract price.

The wheat pit is not all of an active market, for at the same time there may also be a large volume of business in the corn pit and the oat pit, and a big trade in provisions. In these markets men are just as engrossed

by the business in hand and just as oblivious to all other matters as are those in the wheat pit.

While a wild market with its rapid price fluctuations is a commercial drama where actors are real and where, not the applause of an audience is sought, but business interests are at stake—a drama that is almost a tragedy in its seriousness,—from this, a decline to a period of quiet markets and small fluctuations and dullness brings not only relaxation but even comedy. Seriousness, intenseness, the stress of great responsibility, the recollection of past excitement or of what tomorrow may hold—all occasionally give way while life is for a moment turned into a joke; a battlefield into a scene of comedy.

It is natural, perhaps, that for the public there should be a great deal of human interest, and some sentiment as well, attached to the men in the pit. Yet the pit trader is very human, and when out of the pit he does not differ from the average man in quality of nerves nor in ability to suppress excitement; nor is it apparent that his occupation is any more exhaustive than many quieter ones, and perhaps not so much so. It might be different if the market were at high pressure all the time.

Most of the pit traders are, of course, in the employ of some of the many commission houses. Some, however, are brokers who execute orders for any member, on commission. There are still others who never have any orders; they trade for themselves only, and are speculators purely—"scalpers" or "floor traders." While the latter make many trades during the day, they have no influence whatever on the average price, because they are continually in and out of the market.

The orders received by the pit traders come from many sources. Of course, the future markets have as

their basis the hedging of the elevator companies and the mills. The local elevator companies, line or terminal, are continually selling in the pit against purchases of cash grain, and buying in the pit as they sell the cash grain to millers or exporters. Then, too, they often change their hedges from one future to another. Out-of-town elevator companies and grain dealers are also continually selling or buying against transactions in cash grain. Millers, too, when they buy wheat against which they have not yet sold flour, will sell the wheat in the pit. When they sell flour they buy back their hedge. Or, they may sell the flour first, and buy wheat in the pit against the flour sale; for if they had first looked about to buy the actual wheat, they would have missed the sale of flour. Now when they buy the wheat, they sell out the purchase made in the pit. Wheat exporters will operate in the same way, and a considerable amount of business is done by European importers.

From the sources mentioned in the preceding paragraph it can readily be seen that an immense volume of business flows into Chicago, business that may be classed as legitimate to distinguish it from speculative.

Yet there is a class of trading in the pit that seems to be of a semi-speculative nature. While there are many elevator managers who would not enter into a straight speculative trade, some of them are not averse to making "spreads." That is, buying one future and selling another, or buying wheat in one market and selling it in another. Furthermore, many people in the grain trade will occasionally buy or sell a little wheat in the pit purely as a small venture; and whether they gain or not the result is of no particular moment, yet such transactions help to swell the volume of business in the pit.

All the out-of-town orders are, of course, sent to commission houses and executed by the pit traders of the latter. Some of the commission houses have offices in other cities where orders are taken by their own agents, and other commission houses also send orders over private or public wires. A large volume of business comes to the Chicago market in this way from other markets—Minneapolis, Duluth, St. Louis, Kansas City, Milwaukee, Detroit, Toledo, New York and others; and it is an impossibility for the commission houses in Chicago to distinguish between the legitimate and the speculative orders, except in an extremely small percentage of instances. Yet, of course, every commission house has some local patronage that is known to be of a speculative nature.

During the last dozen years conditions have greatly changed in the Chicago market. Ten to fifteen years ago there was, in the aggregate, a large volume of out-of-town business received by the commission houses in small orders. It was sent direct, and the telegrams were continually being received on the Exchange floor during the trading hours. This business is now of much smaller volume. Also, some years ago, there was a steady business from the markets of Europe; but this, too, has shrunken, although there was an increase in 1907.

Yet, on the whole, the dealings in wheat futures are greater than they have ever been except during the active periods of bull markets. While there is a big general trade, there has been a change from small orders to large ones: from a scattered trade to the concentrated operations of "professional" traders. There are fewer small orders and fewer foreign orders, but more big traders. And this brings us to the objectionable features of spec-

ulation in the Chicago market. Importers in the European markets frankly say that they are afraid of manipulation, and that they would trade in Chicago much more than they do if this menace were removed. The subject of market manipulation is touched upon at some length in the general chapter on grain exchanges.

In a way the Board of Trade suggests the arena at Rome when the Empire was at its greatest. There were other arenas, other gladiators and other populaces; but there was only one Rome. And so there are other markets, other exchanges and other centers of great importance in certain particulars; but there is only one Chicago.

Author's Note.—Since this chapter was written, or in May, 1908, the Board of Trade rules were changed so that, beginning with the December, 1908, future, No. 2 hard winter wheat may be delivered on contracts without discount. Under the old rule there was a "penalty" or discount of 2 cents a bushel.

CHAPTER VI.

THE MINNEAPOLIS CHAMBER OF COMMERCE.

Minneapolis has the distinction of being the greatest primary wheat market in the world. It is also the greatest milling center, the second elevator center, being exceeded only by Chicago; the second in receipts of all grain, an important future market, and the greatest flax-seed-crushing center.

In the natural order of things a market at Minneapolis was a foregone conclusion. Nature supplied the broad expanse of wheat lands to the west and northwest, and when wheat enough began to be raised, mills were built on the Falls of St. Anthony, now the center of Minneapolis. Elevators came as a matter of necessity; and then, as the amount of wheat became greater than the requirements of the mills, a market began to develop. An organization came as a natural evolution, and the grain exchange, called the Chamber of Commerce, was the result.

The grain business of Minneapolis all centers in the Chamber of Commerce. Every car of grain coming into Minneapolis, whether for mill, elevator or commission house, is sold by sample on the tables at the Exchange. The mills and elevators, not only of the city but of the whole Northwest, do a large part of their hedging in the wheat pit of the Chamber, while other markets also send a large amount of business.

The membership of the Chamber of Commerce is 550, made up almost entirely of active members. During

the fall of 1905 and again in 1906, memberships sold at $5,000, the highest price they have ever reached. In 1903 they sold as low as $1,600, and in 1908 to about $3,000. In addition to the price, a purchaser pays a transfer fee of $15.

The active membership of the Exchange includes the following: Managers or owners of line elevator companies and their salesmen employed on the Exchange floor; managers of terminal elevators and their employes on the floor; members of commission companies (cash grain) and their salesmen on the floor; mill managers and their buyers; members of commission houses (future trading) and their pit traders; brokers; non-residents, members of other exchanges; the linseed oil contingent, and the millfeed brokers.

The non-active members have been reduced to a small number. They are bankers, an insurance man or two, a few ex-active members, a few financiers and several men who have indirect interests in the Chamber and who bought their memberships years ago.

Three-fourths of the wheat received in the market is bought and ground by the local mills. Eighty per cent. or more of the flaxseed received is used by the local linseed oil mills. But by far the greater part of the barley and oats and practically all the rye is shipped to other markets or to outside dealers. Minneapolis is not a grain export market; and for this reason its quotations are not a factor of great importance in European markets.

The wheat receipts at Minneapolis during the last ten years, or since 1897, have amounted to approximately 88 million to 90 million bushels annually, that is, by calendar years. The wheat comes principally from Minnesota and the Dakotas. Shipments of wheat are approximately 20

million bushels annually, some of it going to Duluth, but the greater part to mills in southeastern Minnesota, southern Wisconsin, Illinois and farther east.

Minneapolis has recently developed into one of, if not the, most important barley market in the country. This is due to the decline of barley growing in some other states and to an increase in the Northwest. In 1907 the receipts of barley were 20 million bushels, while in 1908 they will probably be 25 million.

It would, of course, be profitless to speculate on the probable market there might be at Minneapolis had a milling center not developed there. But with a steady local demand for wheat, it was natural that the business of buying the wheat in the country and bringing it to Minneapolis and storing it until required, should grow with the demand for it. The line elevator companies extended their activities farther and farther throughout the Northwest, following the farmer and the railroads as rapidly as they progressed. Thus the greatest wheat-buying industry in the world developed; the line elevator companies, extending their branches out from the common center at Minneapolis, reached every railroad station in the Northwest.

In passing it may be said that to the line elevator companies the rapid development of the Northwest is largely due. Individual or "independent" grain buyers could not have kept pace with settlement nor always have been equal to financing the crop and buying grain at the market price. Like the railroads, the elevator companies have often been, and are even now, criticised by the farmer and the gallery-playing politician. But on the part of the farmer, criticism or complaint is the result of misunderstanding or of some individual grievance.

While some of the big companies always have had, and still have, a monopolistic tendency, they are nevertheless as important factors in the grain states as the railroads. And as they cannot throttle competition nor control prices, and as their dealings are as far above question as those of the banks and jobbing houses of highest standing, these great elevator companies should be regarded with only the friendliest of feeling by the agriculturist.

But only part of the grain received at Minneapolis is shipped in by the big elevator companies, for there are many smaller companies and individual dealers throughout the Northwest buying grain for shipment to the market.

The great terminal elevators at Minneapolis became a necessity as the mills grew, to store the grain until needed. Without them a large part of the wheat would, during the heavy crop movement, go through or around Minneapolis, and would be lost to the mills.

Most of the elevators in Minneapolis are "public" or "regular"; that is, they receive grain for storage from any one. "Private" elevators receive only the grain of the owners.

There are 31 public elevators in Minneapolis, and the combined capacity is 30,500,000 bushels. There are 14 private elevators that are used in the receiving and shipping business, with a combined capacity of 8,500,000 bushels. This gives a total capacity of 39,000,000 bushels, without including mill storage, which is really a part of a mill; linseed oil mill storage, nor any other storage used as part of a manufacturing plant.

The interests of the mills in the market are quite different from those of the elevator companies. The mills are always buying in the open market; they never buy in

the country; the line elevators buy in the country and sell in the market; the terminal companies buy in the market and sell again there or to mills in other cities. The commission men merely sell the grain that is shipped to them to the best customer they can secure.

In the course of a year the hedging of the mills amounts to a large volume of business for the local pit. The line elevator companies sell in the pit against their daily purchases of wheat in the country. There is a steady volume of such hedging sales during the crop-moving period, or from September 1st to January 1st. Of course, the heaviest selling is during the fall months; for later, hedges are bought in as the wheat is sold to mill or terminal elevator. Thus the taking off of hedges offsets the placing of new ones.

The terminal elevator companies begin placing their hedges as soon as stocks of wheat begin to accumulate in their houses, which is by the first of September. They sell for December delivery. Some of these hedges are never bought in, as the wheat may be delivered in December. Or, perhaps, the December sale is bought in, in the pit, and the wheat sold again for May delivery.

Minneapolis is a market of many commission houses and private wires. There are several private wires from the Chamber of Commerce offices to Winnipeg, touching at intermediate points. Private wires between the Chamber and Board of Trade offices, in Chicago, are numerous, and there are several direct private wires to New York, operated by Chamber of Commerce firms who are members of the Stock Exchange or who have connections there. Two telegraph companies have offices on the Exchange floor of the Chamber, with a large force of operators.

There is one feature of the Minneapolis future market that has an important bearing on the whole. That is, the "contract" grade, or the grade of wheat that is deliverable on contracts made in the future market. The contract grade is No. 1 northern, and all transactions in the pit have as their basis this quality of wheat. A few years ago some of the elevator companies tried to have the rules changed so that No. 2 northern could also be delivered on contracts at a certain difference in price, but the effort was defeated by the milling interests.

If one were called upon to criticise the market, the matter of contract grade would probably be the feature to be questioned. For, when it is considered that not over 25 per cent. of the entire receipts of wheat are No. 1 northern, it becomes apparent that the tendency due to limiting deliveries to this grade must be toward narrowing the market rather than broadening it; toward localizing rather than making it general; toward a market, in fact, easily congested and lacking in some of the essential qualities that go to make up a big, broad-gauged, metropolitan or international market. As an illustration it may be said that the day this paragraph was written Minneapolis May wheat was 11 cents higher than Chicago May.

MILLING—WHEAT GROUND IN THE NORTHWEST.

Minnesota is a great milling state even without Minneapolis, and the amount of wheat ground in North and South Dakota is also considerable. According to statistics compiled by the Northwestern Miller in 1906, largely based on actual returns from the mills and partly by

estimates, the wheat ground in the Northwest is approximately as follows, together with the number of mills:

	Bushels, wheat.
Minneapolis, 22 mills	65,500,000
Duluth, 4 mills	4,500,000
Minnesota, not including above, 322 mills	53,000,000
North Dakota, 64 mills	8,300,000
South Dakota, 97 mills	6,700,000
Total Bushels	138,000,000

For the season from September 1st, 1905, to August 31st, 1906, the mills of the three states actually ground 138,000,000 bushels of wheat; and of this amount Minneapolis used 65,500,000. While these respective amounts will, of course, vary somewhat from season to season, it may be assumed that the figures represent a basis sufficiently accurate for any necessity that may arise for their use.

The flour output of Minneapolis for the crop season, September 1st to August 31st, ranges from 13,000,000 barrels to 16,000,000. Since 1895 the lightest season was that of 1904-05, the short-crop year. The greatest production was for the season of 1902-03, when the output amounted to 16,505,000 barrels. For the year ending August 31st, 1907, the output was 14,160,000 barrels.

The flour exports since 1900 have ranged from 16 to 20 per cent. of the total production. Previously to 1900 for a period of 20 years the exports were from 25 to 38 per cent. of the total output, though the amount of flour made then was much smaller than since 1900.

The greatest volume of exports was from September 1st, 1898, to August 31st, 1900: for two seasons they

amounted to 4,593,000 barrels and 4,847,000 barrels respectively. There has since been a steady decline from those great amounts to approximately 2,500,000 barrels exported annually. There are several causes for the decline in the export flour business, a discussion of which does not come within the scope of this work; suffice it to say, however, that the decline is not a local matter but general throughout the country.

There is something of particular interest in the size of the mills of the Northwest. There are only two in Minneapolis having a capacity under 1,000 barrels a day; neither of these is owned by the big companies. The stated capacity means the amount of flour that can be made in 24 hours; and to arrive at the amount of wheat ground, the number of barrels is multiplied by 4 1-3 or 4 1-2, which is the amount of wheat required by a modern mill to make a barrel of flour.

Several of the Minneapolis mills have a capacity of 3,000 to 3,500 barrels; there is one of 6,700 (amount actually made), two of 11,300 each, and one of 16,000 barrels. The latter will actually turn out 16,113 barrels of flour in 24 hours. This mill was originally built with a capacity of less than half its present size, and although the building has never been enlarged, the machinery has been changed and increased from time to time. What is true of this mill in that respect is also true of the other big mills.

Outside of Minneapolis and Duluth, Minnesota has, according to a list compiled by the Northwestern Miller, 322 mills. Of this number 141 are under 100 barrels daily capacity; 107 are from 100 to 200 barrels; 44 from 200 to 500 barrels, while 30 are greater than 500 barrels.

Several of the latter are of from 1,200 to 3,000 barrels capacity.

North Dakota has 64 mills, as follows: Under 100 barrels, 17; of 100 to 200 barrels, 31; of 200 to 250 barrels, 6; and over 250 barrels, 10 mills.

South Dakota has 97 mills, 52 of which are under 100 barrels; 35 of 100 to 200, 4 of 200 to 250; and 6 of over 250 barrels capacity.

Author's Note.—In May, 1908, an effort is again being made to change the rules of the Chamber of Commerce, to permit No. 2 northern wheat to be delivered on contracts at a price difference of about 3 cents.

CHAPTER VII.

THE DULUTH BOARD OF TRADE.

DULUTH, at the head of the Great Lakes, 1,000 miles by water from Buffalo, is an important receiving and shipping and direct export market. It is also a great elevator center; third in the country, in fact, and therefore in the world. Another distinction for Duluth is that it has the only flaxseed future market of any importance in America. In addition to grain an immense tonnage of flour from Minneapolis and other points is shipped down the lakes from Duluth during the season of navigation, but of course this has no connection with the local market.

An importance is given to the Duluth market by reason of wheat and flaxseed being sold directly to importers; and for this reason Duluth quotations and Duluth wheat are features of European markets. Since the increase in the durum or macaroni wheat crop in the Northwest Duluth has had a larger export trade, for the greater part of the durum wheat is sold to Europe.

The Duluth Board of Trade, the name of the market association, is a substantial and well-governed organization, though of rather limited membership. The number of memberships is only 200, and most of them are now owned by active members; and, due to the small number, the price is high. During the fall of 1906 transfers were made at $5,000, and a year later at $4,000. There is a transfer fee of $5 to be paid by the purchaser.

Besides the local grain commission and elevator com-

panies, all the big Minneapolis companies have memberships in the Board of Trade and have offices in Duluth.

The future market for wheat is not a broad one: largely, no doubt, because of the proximity to Minneapolis, which gets most of the hedging of the elevator companies. The flaxseed market, however, is quite the reverse. Minneapolis has tried at least twice to build up a future market, but the business will not leave the Duluth pit, in spite of the fact that Minneapolis has the oil mills and many big elevator companies. Eastern buyers of flaxseed trade in the Duluth market because it is the shipping point for flaxseed, and others find it necessary to send their orders there because that is where the volume of business is.

The contract grade of wheat in the Duluth market is No. 1 northern, but No. 2 northern may be delivered on contracts at 5 cents a bushel under the price of the former.

In this connection the writer feels constrained to speak of wheat inspection at Duluth in relation to the export business. As the inspection department is under State supervision, a certificate of inspection for a shipment of wheat is a guarantee of the grade by the State. And as Duluth grades are higher than the Atlantic seaboard grades purporting to be the same, European importers when buying Duluth wheat should ask for guaranteed shipment at the seaboard of the wheat inspected out at Duluth. There is no reason why Duluth wheat should not go through to the seaboard and be loaded on steamers there without losing its identity.

The first fireproof elevator, of concrete construction, in the Northwest, was built at Duluth by one of the big

elevator companies. Some of the big terminal elevators at the Head of the Lakes are across the bay from Duluth, at West Superior, Wisconsin. There are 27 elevators, both public and private, though not including mill storage, with a total capacity of 33,700,000 bushels.

Duluth receives, in the course of the year, from 30 million to 50 million bushels of wheat and ships all but about 5 million of it. The local mills turn out from 1,000,000 to 1,500,000 barrels of flour annually.

The following table gives the amount of wheat, flaxseed and barley received from 1903 to 1907, also the amount shipped, in bushels:

	Wheat Receipts.	Wheat Shipments.	Flaxseed Receipts.
1907	52,300,000	49,207,000	18,981,000
1906	41,558,000	39,152,000	21,784,000
1905	31,187,000	28,127,000	10,750,000
1904	26,655,000	21,400,000	15,327,000
1903	29,091,000	26,560,000	18,456,000

	Flaxseed Shipments.	Barley Receipts.	Barley Shipments.
1907	18,337,000	9,746,000	9,689,000
1906	21,950,000	9,705,000	10,206,000
1905	15,807,000	8,378,000	8,865,000
1904	13,332,000	8,438,000	8,378,000
1903	16,341,000	6,543,000	6,520,000

In addition to the foregoing, Duluth received from 4,000,000 to 10,000,000 bushels of oats and nearly a million of rye annually.

The heaviest shipments from Duluth are of course during the summer and fall months; and from the time the crops begin to move until navigation closes, the capacity of the port is taxed to its fullest. For example, during the fall of 1907, or from September 1st to the sailing of the last boat early in December, the shipments of wheat alone amounted to 32,691,000 bushels. During October 11,397,000 bushels was shipped. In addition to the wheat shipments, 17,000,000 bushels of other grain

was loaded out, or a total of 50,000,000 bushels from September 1st to about the 10th of December. This vast volume of business (although there was flour and ore and lumber besides), conveys some idea of the resources of this inland port.

The season of navigation opens at Duluth as soon as boats from the lower lakes can come up through the narrow waterways between Lake Huron and Superior. The opening at Duluth is sometimes as early as April 6th, but usually about April 20th, though again it is as late as May 2nd, or even May 18th. Navigation closes from December 1st to the 10th.

TRANSPORTATION ON THE LAKES.

So great is the amount of tonnage in grain and flour and iron ore from Lake Superior east that it is not easily comprehended; but when to this is added the west bound traffic of the lower lakes, the transportation of this great waterway becomes one of the marvels of commerce. A magnificent fleet is employed on these lakes; in 1907 there were 1844 steam vessels having a gross tonnage of 1,841,400; 519 sailing vessels, and an auxiliary fleet of 209 barges and 480 canal boats. The total gross tonnage was 2,234,400.

It is said that over one-third of the tonnage of ships, and half the steamers of 1,000 tons and upwards under the American flag are on the Great Lakes.

The bulk of the east and the west-bound business passes in Lake Erie; and in 1906, during a season of 230 days, the total tonnage east and west-bound passing over the Lime Kiln Crossing below Detroit amounted to over 70,000,000 tons. Over 25,000 vessels passed Detroit, an average of one ship every thirteen minutes, and 200

tons of freight a minute for the season. In writing of this immense traffic, Mr. Walter Thayer, eastern manager of the Erie & Western Transportation Co., Philadelphia, says: "These figures exceed those of any navigable stream in the world." They of course include the Lake Michigan business.

The records at the Sault Ste. Marie locks indicate the business of Lake Superior. In 1906 the principal east-bound tonnage was, Iron ore, 35,357,000 tons; wheat, 84,271,000 bushels; other grain, 54,341,000 bushels, and flour, 6,495,000 barrels. A considerable percentage of the grain was from the Canadian ports, Fort William and Port Arthur.

Nowhere in the world has water transportation service been reduced to greater perfection than on the Great Lakes. In the matter of loading and unloading vessels it is doubtful whether the records can be equaled. Grain is spouted from the elevators into the holds of the vessels, while in unloading in the lower lake ports, an "elevator leg" is put into a hatch, and by means of an endless chain of buckets the grain is scooped out of the vessel and carried into the adjoining elevator. Iron ore is loaded quite as handily as grain by chuting into the hold through all the hatches at the same time. There is a record at Duluth of loading 9,277 tons of ore into a steamer in 70 minutes, or at the rate 7,288 tons an hour.

Mr. Walter Thayer, expert on transportation, writing for the Annals of the American Academy of Political and Social Science, says that just here we have the keynote of the transportation service on the lakes. It is to secure for each vessel the least possible delay at port of loading or of discharge and consequently the greatest number of round trips possible in a season.

The average number of trips that a modern vessel is able to make from the head of Lake Superior to Lake Erie is usually estimated at twenty during the season. Some boats make twenty-five or even more. Every additional trip reduces the average cost of transportation and the entire carrying trade is ever pressing to reduce delay, whether at terminals or enroute. To the genius displayed in devising plans to accomplish the result, says Mr. Thayer, is due in no small degree the record the lakes have made in affording the cheapest transportation in the world.

This is a factor, when taken in connection with the fact that the rate on wheat from Duluth to Buffalo is just what the companies can get, and the additional fact that rates on the lakes are not regulated by the Interstate Commerce Commission—the matter of cheap transportation for wheat is a factor of great adverse influence in the milling business in the Northwest.

It appears that the rate per bushel for carrying grain down the lakes depends entirely on the number of boats available for the trade. Charters for the season such as are made for ore, are not characteristic of the grain trade. Some very low rates are made for carrying wheat from Duluth to Buffalo. During the season of 1906, for example, the average rate per bushel was 2.2 cents; and for the season of 1907, about 2 cents. In the fall of 1907 a 1-cent rate was made on some shipments. The great cargoes that can be carried, as well as the rapidity with which vessels can be loaded, are a factor in the cheap rates. The average cargo of wheat out of Duluth is about 250,000 bushels, but during the summer of 1907, the steamer W. M. Mills of the Western Transit Co.'s line, loaded 415,799 bushels.

Considering the ease of loading together with the great cargoes that are carried, it is obvious that cheaper rates can be made on wheat than on flour; and as this cannot be regulated by the Interstate Commerce Committee, it gives Eastern millers an advantage over Northwestern. As the spring wheat is in demand by Eastern millers to blend with their softer wheat, and as they can get it at Buffalo relatively cheaper than Northwestern millers can deliver flour there, a handicap is placed upon the Northwestern millers although they are right at the source of supply. In fact, Northwestern millers are compelled to pay a high price for spring wheat—high as compared with all other markets—in order to keep the wheat from going down the lakes in a volume so great as to actually cripple their business. Whether this great economic injustice can be corrected, is not, of course, a matter to be discussed here.

In connection with transportation on the lakes, the canal improvements from Buffalo to the Hudson river, which means, of course, New York City, is a pertinent subject. It will be left, however, to the chapter on the New York market.

CHAPTER VIII.

NEW YORK PRODUCE EXCHANGE.

New York is the most important export grain market and exporting port for grain and flour in the country. Furthermore, the exporters of New York do a large business at other ports along the coast and on the Gulf. The future wheat market, while not a broad, general and important one, is traded in rather largely at times by the importers of Europe, while New York quotations have more influence in foreign markets than any other from America excepting Chicago.

The New York Produce Exchange, at the foot—or the "bottom," as our English friends would say—of Broadway, has for its home one of the most substantial exchange buildings in the world, and the property is doubtless the most valuable of all the exchanges. The Exchange resembles the continental bourses more than any Western exchange does, because of the variety of interests there. Yet it is behind Philadelphia in this respect, for the Bourse of that city might be transferred to some continental European center and not appear strange nor out of place.

There were at one time 3,000 memberships in the Produce Exchange, but some of them have been bought up by the association and canceled. In the fall of 1907 the Exchange had 2417 members, the approximate price of memberships was $400. The transfer fee is $50. The price of memberships would doubtless be much higher but for the "Gratuity fund" or insurance feature of the charter, which imposes rather a heavy tax on members.

There is, of course, a large local business in the New York market, and a feature of it is the flour trade. The big mills of the country are represented on the floor by agents or brokers. The local millers—New York is the third milling center in the country, with a daily capacity of 12,500 barrels—the local millers buy the bulk of their supplies on the Exchange, through brokers.

It is, of course, impossible to form any idea of the amount of export grain business done at New York, but a very large part of the business of the country originates here, although other ports and some of the inland markets have direct exporters. There are probably two dozen important grain exporting houses in New York. These export houses, of course, have correspondents in all the markets of the importing countries and also in all the markets of the West where grain is sold for export. As the principal freight brokers and ship agents are members of the Exchange, bookings are made here not only for New York but for any other Atlantic or Gulf port also. Wheat is usually bought by both grade and sample, except Duluth wheat, which is usually bought on Duluth certificate of inspection. When Duluth wheat is so bought, the shipment is followed through, and the actual wheat inspected out of store at the Head of the Lakes is loaded on board the vessel at New York. The only place where the wheat can lose its identity in transit is in the elevators at Buffalo, through which it is necessary to run it, in order to transfer it from lake boats to cars or canal boats for shipment to New York. If this happens, however, it is due to negligence on the part of the exporter.

New York is not a great elevator center, and the elevator business has been both very profitable and very unprofitable here. At one time large stocks of wheat

were carried in store, and some heavy storage charges are told about; but that is a thing of the past, and stocks of wheat in the elevators of late years represent local mill supplies and grain awaiting shipment. The total elevator capacity of the port is 13,000,000 bushels, and the number of houses is eighteen.

The contract grades in the future market are No. 2 red winter and No. 1 northern spring wheat. However, the following grades may be delivered on contracts at the difference stated: No. 2 hard winter and No. 2 white winter, 2 cents under the contract price; No. 3 red winter and No. 2 northern spring, 5 cents under; No. 3 hard winter, 7 cents under.

At one time the rules permitted wheat in elevators at Buffalo to be delivered on contracts at the contract price less the freight. This was to do away with manipulation, which at that time was rather a too-frequent feature of the market.

A large volume of business in the aggregate comes to the New York future market from other exchanges, in the way of spreading. This is, buying or selling here and doing the opposite in some other exchange. Owing to this not being a broad, general market, it sometimes gets out of line with others, and spreading orders bring about a proper balance again. Or, it might be put another way, and both be right. That is, New York is less erratic than other American markets.

The time of trading corresponds to that in the Chicago, Minneapolis, Duluth, Winnipeg, St. Louis and Kansas City exchanges, although it is one hour later by the clock. That is, the hours are 10:30 to 2:15, which is the same as 9:30 to 1:15 in the Western cities. Liverpool opens at 10:30, and the opening price and the 1:30 quo-

tations are received in New York and the Western markets about three-quarters of an hour before they open.

Receipts and shipments of grain at New York for the last five (calendar) years were as follows:

Wheat—	1907.	1906.	1905.	*1904.	1903.
Received.....	33,573,000	24,700,000	11,432,000	8,401,000	22,347,000
Shipped.....	27,112,000	19,570,000	6,406,000	1,750,000	15,182,000
* Short Crop.					
Corn—					
Received.....	22,286,000	21,938,000	30,298,000	15,504,000	27,428,000
Shipped.....	20,960,000	20,480,000	27,200,000	10,019,000	21,986,000
Oats—					
Received.....	26,754,000	31,207,000	35,721,000	28,827,000	29,504,000
Shipped.....	2,356,000	6,092,000	7,235,000	1,875,000	2,892,000
Barley—					
Received.....	3,027,000	6,329,000	9,189,000	6,432,000	3,492,000
Shipped.....	264,000	4,421,000	5,842,000	2,489,000	591,000

The exports of wheat and corn from New York for a long series of seasons, is shown in the following table, seasons beginning July 1st and ending June 30th:

Year ending June 30—	Wheat. Bushels.	Corn. Bushels.
1884.....	20,445,000	19,005,000
1885.....	26,345,000	20,130,000
1886.....	21,230,000	24,708,000
1887.....	40,563,000	14,157,000
1888.....	25,221,000	8,667,000
1889.....	9,086,000	26,658,000
1890.....	13,438,000	28,872,000
1891.....	12,860,000	12,089,000
1892.....	61,755,000	20,634,000
1893.....	39,519,000	12,296,000
1894.....	30,604,000	16,424,000
1895.....	20,793,000	7,536,000
1896.....	18,994,000	23,527,000
1897.....	18,970,000	24,340,000
1898.....	36,522,000	42,105,000
1899.....	42,075,000	32,929,000
1900.....	23,108,000	40,019,000
1901.....	23,063,000	44,529,000
1902.....	22,137,000	8,300,000
1903.....	17,403,000	13,746,000
1904.....	3,430,000	13,687,000
1905.....	.....	21,473,000

CANAL IMPROVEMENTS FROM THE LAKES.

New York is the natural or geographical outlet for the immense volume of export business that comes down

the Great Lakes; and the port and the lakes are soon to be given the connection that the great traffic demands and which selfish interests have for years combined to refuse them. That is, proper water connections; a modern canal system; one that is really a competitor of the railroads.

This will not be by enlarging or improving the Erie canal, but a new canal, lake and river route. The construction of what is in reality a series of new and the improvement of natural waterways from Lake Erie to the Hudson river, is under way and parts of the work had even been completed in 1907. The project is the result of an investigation that was begun in 1899 by a committee appointed by the governor of the state. The committee reported to the legislature in 1900, and in 1903 a bill was passed providing for an issue of bonds to the amount of $101,000,000. It was necessary to have this approved by a popular vote, which was done, and the bonds accordingly authorized.

The new canal will follow the line of the Erie from the Niagara river at Tonawanda to the vicinity of Lyons. From this point it will go to the south of the Montezuma marshes, into the Seneca and Oneida rivers and across Oneida lake. More than half the new route will be through river channels and lakes. From Oneida Lake it crosses to the Mohawk river west of Rome, and then utilizes the bed of the river most of the distance to Waterford, on the Hudson.

Fewer but larger locks will be used in the new canal than in the Erie. At Lockport two locks will be used instead of five, while above Waterford five locks will replace the sixteen of the old canal. The five locks will have a fall of thirty-four feet.

The channel will have a minimum depth of 12 feet, while the minimum width at the bottom will be 75 feet for the canal sections and 200 feet in the rivers. The locks will be 328 feet in length and 45 feet wide. They will permit the passage of two boats, at the same time, of 150 feet in length and 42 feet width, drawing 10 feet of water and having a capacity of 1,500 tons each. It is probable that the barges will usually go in fleets of four; that is, one steamer towing three barges; for steam will be used as the power. It is estimated that the trip from Buffalo to New York can be made in five days. The total distance by the new route is 343 miles, of which 175 miles will be by river and lakes, and 168 miles by canal and locks.

While the new water route will not be completed before the time set for the completion of the Panama canal, or about 1915, it should be, and doubtless is, a matter of great satisfaction to the Northwest, as well as to New York, to know that contracts have been let and work is progressing. For it requires no statistician to estimate the advantages to the grain and flour trade that the cheap rates from Buffalo to New York will bring. Furthermore, the big barges will be able to make the passage through Long Island Sound to New England ports, and down to the Delaware and Chesapeake Bay. The importance of the port of New York will, it is very apparent, be increased as an exporter.

CHAPTER IX.

KANSAS CITY BOARD OF TRADE.

Kansas City occupies an important position among the great primary wheat markets—Minneapolis, Duluth and Winnipeg. It is the distributing point for the Kansas and Oklahoma crop, shipping wheat to mills throughout the states as far east as Ohio, and to the markets of St. Louis, Toledo, Chicago, and north to Minneapolis. Kansas City is also an export market, working via the Gulf. Furthermore, it is a consuming market, for this is a milling center, manufacturing some 2,000,000 barrels of flour annually. The importance of the cash wheat market somewhat overshadows that for futures; and yet there is at times an important business done in the Kansas City wheat pit.

The distinguishing feature of this center is that it is a hard winter wheat market. It stands for the Southwest just as Minneapolis does for the Northwest, and Winnipeg for the Canadian West.

Receipts and shipments of wheat at Kansas City during the last five calendar years were as follows, in bushels:

	Receipts.	Shipments.
1907	36,817,000	28,866,000
1906	37,423,000	25,685,000
1905	29,368,000	37,423,000
1904	29,137,000	40,038,000
1903	38,322,000	25,710,000

The elevator capacity, not including mill and small private storage, is 9,000,000 bushels. There are four ter-

minal elevators of 1,000,000 bushels each and half a dozen of from 500,000 to 800,000 bushels each.

Kansas City has eight large mills, three of which are of 1,000 barrels per day capacity, one of 1,500, one of 1,800, two of 2,000, and one of 3,500 barrels.

The Board of Trade of Kansas City differs from the other grain exchanges of the country in that it is a voluntary association instead of a corporation. This, however, has apparently made no difference in maintaining a market, making rules and enforcing them and in originating and distributing quotations.

The association has a membership limited to 200. Sales of membership were made during the fall of 1907 at $2,000 each. A peculiar feature of the association rules is that a fee of $500 for the transfer of memberships is required.

The contract grade in the Kansas City market is No. 2 hard winter wheat of not less than 59 pounds, but No. 2 red may be delivered at the seller's option.

It was, of course, the celebrated hard winter wheat that has built up the Kansas City market; and it now has all the necessary factors to cause it to increase in importance, namely, the location, the wheat supply, the demand, local consumption and an export outlet. Furthermore, the Board of Trade has some very aggressive members, who do a direct business with many mills to the east, and with Europe, instead of letting this business be drawn to other markets.

The future market is largely traded in at times by members of other markets in the way of spreading. If the market gets out of line with others, there are always traders ready to buy or sell, as the case may be; and such trading restores the balance. Kansas City is supposed to

reflect the Southwestern crop situation from spring until harvest a little closer than other markets. It does, theoretically, at least, just as Minneapolis reflects spring wheat conditions; but the reflection is sometimes distorted by fallible human nature.

The Kansas City market of course gets a large amount of local and Southwestern hedging business from elevator companies and millers, and the volume of such trading should steadily increase; for the market is yet young. But it is probably as a cash wheat market—an elevator and milling center and a distributer for the Southwestern hard winter wheat—that Kansas City will find its greatest importance in.

CHAPTER X.

ST. LOUIS MERCHANTS' EXCHANGE.

St. Louis is one of the great primary grain markets of the country, especially for corn and oats; and its location makes it a natural receiving and distributing point. It draws grain from Missouri, Illinois, Iowa, Nebraska, Kansas and Oklahoma, and ships it to eastern and southeastern points. Many mills in Kentucky and Tennessee and southern Illinois are dependent on this market for part of their supplies. Furthermore, this is a consuming market as well, for mills having headquarters here grind some five million bushels of wheat annually. St. Louis is also a large export flour market. Approximately one million barrels of flour, a considerable part of which is made by outside mills, is annually shipped from the city on through bills of lading to foreign countries.

As a natural market place there is more of historical interest associated with St. Louis than perhaps any other city in the country. It was the Mississippi river, of course, that made St. Louis possible; for this spot in the Western wilderness could be reached by water many years before it could overland. And so it became the outfitting point for hunters, trappers and exploring parties; and it was the first market to receive such of them and their plunder as returned. As the country developed, St. Louis continued to be the distributing point for supplies of all kinds for a great area; and, in return, the receiving point for the products of the vast agricultural country that was opened up. In the old days before the railroads, the levee

was one of the busiest scenes in the country. The Mississippi was then a "trunk line," and steamboats lined the waterfront, loading, unloading and waiting their turn. The levee, from spring until fall, would be piled high with stuff of all descriptions, either being received or shipped, and drays were dodging about in the wildest confusion, carrying away goods and hauling more for shipment. There was a great traffic on the river in those days, and the rapid development of the West is the result. Without this great waterway the West could not have developed as it did; and if the country forgot the river, it was but temporarily. The Mississippi will be developed, brought up to the standard of present-day usefulness, and will again become a great "trunk line"; and St. Louis as a market place will increase in importance, and, furthermore, will become one of the principal grain exporting centers.

THE MARKET.

The Merchants' Exchange of St. Louis is more than a grain market, for the association, in its activities, is like the commercial clubs or boards of trade of some American cities, and like the chambers of commerce of French cities. In fact, the Merchants' Exchange was organized by merchants, in 1836, with no thought then of an exchange or a market, and it was called the Chamber of Commerce. The exchange was organized in 1849, about the same time the Chicago and the Toledo grain exchanges came into existence.

The present membership is approximately 1,700, and is made up of grain commission men, brokers, millers, flour merchants, manufacturers, transportation agents, produce and seed dealers, and several bankers and real estate men are also members.

The price of membership is low, when compared with other western exchanges. It is approximately $100, to which is added a transfer fee of $20 and annual dues, in 1908, of $40.

While the Merchants' Exchange is a subject of great general interest in the work that it has done and is continually doing for commercial St. Louis, only the grain market feature of it comes within the scope of this article.

The St. Louis wheat market has for its basis the wheat that it receives, carries in stock, grinds and ships. Being a consuming market and an elevator center of course gives a substantial basis for a future market. While the local market depends upon Chicago in a general way, as all other markets do, it has a certain independence, due to the milling demand for wheat both locally and for shipment. For example, May wheat in St. Louis often sells one, two or three cents higher than in Chicago, although a normal position is three cents lower, for the reason that the demand for wheat in the spring by mills in the St. Louis territory is greater than the supply.

The St. Louis pit has been the scene of some great speculative transactions, where giant fought giant and where millions of bushels of wheat were bought and sold in an attempt to control the market. Some of the greatest battles of the grain trade have been fought here, and St. Louis has had some of the biggest and boldest traders of the country. At the present time, however, the future market is narrower and is lacking in such transactions as have distinguished it in the past. This, of course, is as it should be, for the market is enabled to fulfill its legitimate functions in the routine business of the grain

dealer and the miller. A market that is made the plaything of a few big traders may be spectacular, but it is not useful.

St. Louis is a market largely used by spreaders—buying or selling here and making the opposite trade in some other market. This market is thought to reflect winter wheat crop conditions more faithfully than any other market. Millers to the southeast use this market largely, particularly for buying the May future to demand delivery of the wheat.

This is, of course, a winter wheat market, but there has been a great change during the last half dozen years. That is, from a soft wheat or red winter, to a semi-hard winter wheat market. While No. 2 red wheat is the contract grade, No. 2 hard winter may be delivered on contracts at 3 cents a bushel under the contract price. Only a few years ago hard winter wheat sold at a big discount under red wheat, but during the spring of 1908 the two varieties commanded approximately the same price. This is an indication of the increasing demand for the harder wheat, which is used by many winter wheat millers to blend with the softer variety.

A feature of the Chicago, Minneapolis, Duluth, Winnipeg and Kansas City exchanges that is lacking in St. Louis is the great line elevator companies—companies having many country houses distributed throughout the grain states. To be sure, there are some line elevator companies in St. Louis, but this phase of the grain business is not a feature of the local market. In the territory adjacent to St. Louis the elevators at country stations are mainly operated by independent or individual owners; and there are also many mills, and these divide the wheat receipts with shippers.

In the St. Louis market there are relatively more commission houses than in other markets; some that do either a receiving or a shipping business only, and others that do both.

The total amount of all grain received in this market annually ranges from 60,000,000 to nearly 90,000,000 bushels, depending upon the size of the crops. St. Louis is the third primary market of the country, made so by its large receipts of corn and oats.

The grain receipts from 1904 to 1907 were as follows, in bushels:

	1907.	1906.	1905.	1904.
Wheat	17,770,000	17,646,000	21,001,000	23,148,000
Corn	35,117,000	20,725,000	18,067,000	18,246,000
Oats	30,195,000	28,522,000	19,278,000	17,109,000
Rye	420,000	543,000	569,000	674,000
Barley	2,964,000	2,834,000	2,921,000	3,163,000
Total	89,469,000	80,271,000	61,839,000	62,340,000

Shipments of wheat in the same years were, 24,000,000, 18,240,000, 13,790,000 and 15,250,000 bushels, respectively. The amount of wheat carried in store ranges from 3,000,000 to 6,000,000 on January 1st.

St. Louis has for many years been one of the important milling centers of the country and a large exporter of flour. St. Louis flour has long been a standard throughout the South and wherever winter wheat flour is used. Since the coming of the hard winter wheat of Kansas and Nebraska, some millers in the St. Louis territory have either refitted their mills or built new ones for the purpose of grinding this wheat solely.

DEEPENING THE CHANNEL OF THE MISSISSIPPI.

St. Louis is now working, through its Business Men's League, for an appropriation and a river commission with the end in view of obtaining and maintaining a 14-foot channel for the Mississippi south of the city. In this connection the chapter on "The Mouth of the Dan-

ube," wherein mention is made of the European Commission of the Danube, may be found of particular interest.

It may be accepted as a certainty that St. Louis will secure a 14-foot channel, so that any argument as to its necessity or of the demands of the West for it may be omitted. In time there will also be a deep-water channel and a ship canal to Chicago, but that is a matter of somewhat more distant date.

But as the 14-foot channel from St. Louis south is a matter of the immediate future, one is impelled to estimate the effect it will have on the grain market. It requires no great foresight to see that a vast amount of grain and flour will go down the river for export, and that St. Louis will become a great export market. It also follows that with increased receipts at St. Louis a greater area will be drawn upon; that the market will attract grain from a little farther away in every direction. Furthermore, to accommodate the increased business, new and modern elevators of great size will naturally be built along the waterfront, so that grain may be spouted directly into barges and boats.

It is estimated that with a 14-foot channel the rate per bushel on grain from St. Louis to New Orleans will be one-sixth of the present rate. The rate on wheat from New York to Liverpool is, of course, lower than from New Orleans. But with a 14-foot channel from St. Louis the rate from St. Louis to Liverpool will be approximately the same as from Buffalo to Liverpool. This, of course, in the export of grain, would give St. Louis a decided advantage over other markets. However, this in part would be offset by a relative advance in prices in the St. Louis territory. In other words, the nearer the West-

ern grain states are brought to Liverpool, the higher prices will be, compared with other localities.

A 14-foot channel for the river should also give exporting mills in the St. Louis territory an advantage, particularly those that have a trade in the West Indies, and Central or South America. St. Louis now exports about a quarter of a million barrels of flour annually to Cuba, Porto Rico, the Gulf countries and Brazil. With cheap water rates to the Gulf this trade would no doubt be very largely increased.

CHAPTER XI.

OTHER MARKETS.

OMAHA, the youngest of all the grain exchanges, is a market of considerable more than local importance. The Omaha Grain Exchange was organized in 1903, because of the apparent demand for a distributing market for the wheat, corn and oat crops of Nebraska. The city is an elevator center and therefore a natural market place for the crops to the west.

Omaha receives from 7 to 10 million bushels of wheat annually, and ships practically all of it. Receipts of corn, during years of normal crops, amount to 18 to 20 million bushels; and of oats, 10 to 15 millions. Shipments of all grain are nearly as great as the receipts.

The total elevator capacity of Omaha, South Omaha and Council Bluffs, under the jurisdiction of the Grain Exchange, is 6,000,000 bushels.

The Grain Exchange has a membership limited to 200, while the number of members, early in 1908, was 167. The price of membership at that time was $450.

The contract grades of wheat constituting the basis for the future market are No. 2 hard winter or No. 2 red winter, seller's option.

MILWAUKEE.

As a wheat market, the importance of Milwaukee is now chiefly due to its mills, which use somewhat over 5,000,000 bushels a year. Yet Milwaukee, in the early days of grain exchanges, was a greater wheat market

than Chicago. When the latter finally took the lead, however, some of the grain houses moved down from Milwaukee; for there was not room for two big markets. Milwaukee is unimportant as a future market, but is a large receiver and shipper of the different grains, and is next in importance to Minneapolis as a barley market.

The annual receipts and shipments of grain are approximately as follows: Wheat receipts, 8 to 10 million bushels, and shipments 2 to 4 million; corn receipts, 3 to 7 million, and shipments 2 to 5 million; oat receipts, 8 to 12 million, and shipments 7 to 9 million; and barley receipts, 16 to 18 million, and shipments 7 to 9 million.

Milwaukee is one of the important flour milling centers of the country, and the annual flour output is exceeded by only four cities.

TOLEDO.

Toledo is a receiving and shipping market of considerable importance, and an elevator and milling center. The Produce Exchange is one of the oldest grain exchanges in the country; and a future market with red winter wheat as the basis is maintained. Toledo future quotations are regularly published in some European market papers.

The location of Toledo gave it an importance as a receiving and shipping point for wheat as early as 1845, and late in that year or early in the next, an elevator of 50,000 bushels capacity was built. So Toledo was not only one of the first elevator centers west of the seaboard, but perhaps the first where a movable leg to be dropped into boats, for loading, was used. This was the beginning of cheap grain handling on the Great

Lakes. A steam engine was used for elevating the grain. Several railroads built elevators at Toledo by 1848, and in the following year the Produce Exchange was organized. One of the first steel-tank elevators in America was built at Toledo. It has a capacity of 1,700,000 bushels. The total elevator capacity, exclusive of mill storage, is approximately 7,000,000 bushels.

Toledo draws its wheat supplies chiefly from Ohio and Indiana. But since Kansas has become such a great wheat grower, Toledo brings some hard winter wheat directly from the Southwest for shipment to the East. As the market is distinctly a red winter wheat market, so the mills are soft winter wheat mills. In fact, Toledo is the greatest milling center in the world for this class of flour. The annual output of the mills is approximately 1,000,000 barrels, though as high as 1,670,000 barrels has been manufactured.

BUFFALO.

Buffalo occupies a peculiar position. There is no other center like it anywhere in the world. While the receipts of grain are very large, it is a storage and transfer point for grain coming down the lakes, and not a market place. Yet it is an important milling center, too. The actual flour output is greater than that of any other city in the country excepting Minneapolis, although the stated capacity of the mills is slightly less than New York City and Kansas City. Buffalo is also a great crusher of flaxseed—approximately the same as Minneapolis; and yet, like the latter, it has no flaxseed future market. Unlike Minneapolis, however, it receives its supplies all from other markets, up the lakes, while the Western city draws them directly from country stations.

One is a primary market, taking the country grain; the other takes the surplus from other centers.

A large amount of wheat is stored at Buffalo during the winter; for, owing to the cheap rates down the lakes during the season of navigation, an effort is made to get as much down as possible before winter, for the use of Eastern millers or to be sold for export. Besides the elevators, the boats are used for winter storage, and several million bushels of wheat is stored in them through the winter. The cost is very low. The elevator capacity, exclusive of those connected with manufacturing plants, is nearly 20,000,000 bushels.

PHILADELPHIA.

The grain market of Philadelphia, in the Bourse, is only of local importance, but a large export business is done with Europe by the grain houses of this center.

The elevator capacity of the port is approximately 4,000,000 bushels, and the principal houses are owned by railroads, though operated by other companies. It is estimated that the elevators are equipped to receive 1,000 car loads, or nearly 1,000,000 bushels of grain a day, and to deliver more than that amount. There are several floating elevators at the port, for transferring grain from one boat to another. The largest of these has a capacity of 10,000 bushels an hour.

BALTIMORE.

The Baltimore grain market is also local in its influence, although there are many old and important export houses established here. That is, the market is a local affair, but the export houses are of international importance in the grain trade.

Baltimore is a heavy exporter of both wheat and corn. These grains are sold on certificates of inspection issued by the Baltimore Chamber of Commerce, and such certificates are final. That is, the seller is not responsible for any deterioration that may take place after the certificate has been issued.

Baltimore is one of the few Atlantic ports having a 30-foot channel; and it has one of the best harbors on the coast. The city is 155 miles from the open sea. The harbor itself extends well into the city, and is two and a half miles long and for a considerable part of the distance 850 yards wide.

Since the fire of 1904 the city has built its own docks and wharves, after purchasing many old wharves. The docks and piers are leased to individuals or companies.

HAMBURG.

On the other side of the water the converse of Baltimore is found in the Hamburg market. That is, a large amount of grain is received there, and there are many important importing houses. Yet there is no future market and therefore no official quotations. Yet the Hamburg Grain Exchange differs, too; for it is one of the busiest markets in Europe. During the short session of an hour and a quarter, from 1:45 to 3, the exchange room is crowded with buyers and sellers.

The Grain Exchange of Hamburg occupies one of the largest rooms of the Bourse. The very active Stock Exchange occupies another on the same floor.

CHAPTER XII.

THE WINNIPEG GRAIN EXCHANGE.

It is necessary to consider the Winnipeg market, the Winnipeg Grain Exchange that was and the one that will be, separately. For at this time, April 1st, 1908, the Winnipeg Grain & Produce Exchange Association is quietly passing out of existence, while a new association is as quietly developing from an embryo state to a probable reality. There is and always will be a market at Winnipeg, and its importance will now depend upon the Grain Exchange that is to be.

Briefly stated, the Grain & Produce Exchange was, in February, 1908, put out of business by the passage of an adverse bill by the legislature of Manitoba. It was a case of agrarian legislation, with politics back of it. The Exchange had its charter from the Province of Manitoba, and so the charter was subject to amendments by the legislature; and this was the way the Exchange was attacked.

The farmers of Manitoba and Saskatchewan had for several years been opposed to the Exchange, for the reason, they said, that it destroyed competition in buying grain at country points. As a matter of fact, this was disproved in the trial of some of the directors of the Exchange in 1907, which was in reality a trial of the association, on the charge of conspiracy in restraint of trade. It was shown that the price paid at country points was the Fort William price less freight, other charges and one cent a bushel commission. Furthermore, it was shown

that one cent a bushel was as cheap as the business could be done.

The case was tried before Judge Phippen, at Winnipeg; and on May 21st, 1907, he rendered judgment in favor of the defendants. The following is an extract from the judgment:

I must confess, after what I had read during the last several years, I approached the trial of this case quite prepared for disclosures of methods inimical to the public interests.* * * Yet with all the evidence before me I am forced to the opinion that not only was no undue restraint of trade disclosed, but that the very acts complained of, taken in connection with these surrounding conditions, made, on the whole, for a more stable market at the fullest values and so for the public good.

* * *

The gravium of the whole charge hangs on the commission rule. Doubtless if it was abrogated, some business would be temporarily done at less than 1c a bushel profit, but for how long? Witnesses all agreed this was the lowest profit on which business could live. Such a change must result in unsettled conditions, conditions which, while temporarily profitable to the wheat grower, would inevitably end in an erratic and unstable market. As conditions are now, according to all the evidence, Fort William prices are the highest the world's markets can justify, and these are the prices, less necessary freight rates, storage and carrying charges, and less 1c a bushel as the dealers' profit, which the farmer actually receives for his grain. * * * It would appear in the interest rather than to the detriment of the grain growers that the profits between the grower and the exporter should be taken care of by a fixed, certain and reasonable commission rather than that the market should be destroyed, the legitimate dealers' credit impaired and the grain trade of our great Canadian West made sport for speculators.

In this trial one witness, a farmer from western

Manitoba, said that competition in grain buying had been killed. When asked why he thought so, he replied:

"When I now drive into town with a load of grain there are no buyers on the street. I drive up to an elevator, and the man there gives me a price, which I can take or not. I drive to another elevator and am given the same price. There is no competition; they all pay the same price. It used to be different. When I would go to town, five or six grain buyers would come running out to meet me, maybe at the edge of town. They would jump on my wagon and bid for my grain."

This, the farmer thought, was competition; and he might have added that the highest bidder would ride back on the load with him, "jolly him," give him a chew of tobacco and—but this the farmer did not know—pay him 10 cents a bushel less than the wheat was worth.

Among those old-time grain buyers in both the American and the Canadian West, there was the most flagrant kind of a combination. They would gather around the farmer's wagon and "bid" with great vehemence, but it was usually agreed that the buyer first to jump on the wagon should take that load, and some other buyer the next load. The bidding was fictitious, and the price previously decided upon. It was also long a practice in the American West for the elevator companies to divide the grain purchased at stations, each taking a certain percentage. This practice was decided illegal and has been abandoned.

But to return to the Manitoba farmer. He was satisfied with the appearance of competition, without knowing what his grain was worth based on the export price at Fort William. It is a matter of common knowledge that when grain was bought under such conditions the

margin of profit was large, 5 cents, or perhaps 10 cents a bushel.

Under the present system, both in Canada and the United States, the margin of profit is very small; any one can easily determine it for himself at any time. Furthermore, the farmer may, by inquiring, learn the market price, which is based on world's conditions and is not under the influence of the grain buyers.

This is what the grain exchanges have brought about for the wheat grower—what they have given him in exchange for the fictitious and noisy bidding around the farmer's wagon. And the latter is what the farmers of Saskatchewan and Manitoba, and their political friends have endeavored to return to, and probably hope they have succeeded by the annihilation of the Winnipeg Grain & Produce Exchange.

THE MARKET.

Winnipeg, just at the eastern edge of the agricultural region, is the natural market place for the crops of the great Canadian West. Yet its "base of supplies," the great terminal elevators where the grain is stored for shipment, is 420 miles farther east, at the head of navigation on Lake Superior. In this respect, the Winnipeg market is unique. The price is based on the grain at the lake port, and wheat sold for future delivery means delivery from the elevators at Fort William.

Winnipeg is headquarters for the elevator companies having lines throughout the West and for many commission houses. It is also the railroad center of Western Canada, and all the roads radiate from here, while their many branches diverge at various points and so traverse this whole great wheat country. Therefore, it cannot be

denied that Winnipeg is the natural market place for the West.

The grain inspector for the Dominion has his headquarters here, and the greater part of the grain of the West is inspected at Winnipeg. The following table gives the results of ten seasons' inspection of wheat at this market, and the figures indicate its growing importance:

Crop of—	Bushels.	Crop of—	Bushels.
1897	6,453,000	1902	51,833,000
1898	7,982,000	1903	40,396,000
1899	26,258,000	1904	39,784,000
1900	12,355,000	1905	65,850,000
1901	45,651,000	1906	73,098,000

The contract grade in the Winnipeg market is No. 1 northern, but No. 2 northern may be delivered on contracts at a discount of 2 cents a bushel, and No. 3 northern at about 10 cents.

While a large part of the crop of Western Canada is sold for export, Winnipeg is not an export market. Some wheat is sold from here for direct export, but the business is mostly done through Chicago and Montreal houses.

Several Chicago and Minneapolis commission houses have representatives and offices in Winnipeg, and there are at least four private wires from the Minneapolis Exchange to Winnipeg. There is also a large representation of Minneapolis houses in the Canadian grain trade. Some of the big line elevator companies of the country were organized and are operated by Minneapolis grain men.

THE OLD EXCHANGE.

The Winnipeg Grain & Produce Exchange has, or had, 300 memberships, all of which were sold and mostly

held by active members. During 1906 and '07 memberships sold at approximately $2,400.

The Exchange in its methods was practically the same as American exchanges; and the clearing house for clearing trades in futures was patterned after that of the Minneapolis Chamber of Commerce.

Winnipeg was developing into an important future market. It was not only a hedging market for local elevator companies, but it was also largely used in spreading by traders in other markets; and, furthermore, it was developing as a speculative market.

The association had under way and nearly completed, at the time of the destructive agrarian legislation, a magnificent Exchange building. The dissolution of the Grain & Produce Exchange will, of course, result in the building passing into other hands. Also, the amount invested in memberships will be a total loss.

THE NEW EXCHANGE.

Some of the elevator companies were in favor of doing business without an organization and therefore without Winnipeg quotations. But there are so many other interests that desire an exchange that it seems safe to say that a voluntary association will be formed, instead of a corporation. This association will admit to membership only desirable persons, and some who were discordant factors in the old Exchange will be eliminated. Rules for trading will be adopted just as though the association were incorporated, contract grades for future trading will be established, and official quotations will be distributed. There is precedent for this in the Kansas City Board of Trade, which is a voluntary association. Not having a charter from the Province, the new Ex-

change will be amenable to the courts and not subject to ignorant and prejudiced legislation and to political jobbery.

The new building of the Grain & Produce Exchange will doubtless be bought by a private holding company, and so, in due time, come into the possession of the new Grain Exchange.

The questions naturally suggest themselves, Has the Winnipeg market been crippled either temporarily or permanently, and what is the future of the market? One might reply by pointing out that the machinery of a mill may be torn out and thrown upon the scrap-heap without injury to the trade of the mill, its brands or to the locality that grew the wheat for the mill. The whole future of the mill, as nothing but the machinery was disturbed, would seem to depend upon the new machinery installed.

So it will be with the new Grain Exchange at Winnipeg. All that is required is the market machinery. The men, the natural market place and the crops are all there; and, furthermore, the wheat crop of the Canadian West is increasing so rapidly that in ten years Winnipeg should be one of the most important wheat markets of the world.

CHAPTER XIII.

LIVERPOOL GRAIN EXCHANGE.

LIVERPOOL, buying wheat in all quarters of the world, and also having a market for trading in futures, exerts an influence on prices in all exporting countries. It has an individuality possessed by no other, for it is the central market of the world; and as three-fourths of the trading in futures of the United Kingdom is done in this market it is bound to have great influence in final price making.

A peculiarity of this great market, the Liverpool Corn Trade Association, as the Exchange is called, is the seemingly ordinary, businesslike appearance and lack of all rush and excitement, strain and nervous tension, such as is always in evidence on the Chicago Board of Trade.

There is no pit in the Liverpool Exchange and no noisy trading or demonstration of any kind. The room in which the future trading is done is very small, as compared with American exchanges, and the members or their representatives stand around in conversational groups, during a time of no special activity.

The hours of the Exchange are from 10:30 to 4:15, but from 1 to 3 the room will often be deserted for luncheon. There can be, in fact, no better illustration of the difference between this market and American exchanges in "speculative atmosphere" than this. Here the sessions are long and lacking in excitement and intense interest. In America they are short, and few trad-

ers think of going to luncheon until the gong rings at 1:15. In Liverpool there may be thousands at stake in the market, but it is as if it were in real estate—the turns of the market are slow. In America the market is watched like a throw of the dice.

One is much impressed with the absence of everything connected with a grain exchange in America. There are no brokers' offices about, with rooms for customers, blackboards and quotations and gossip, tickers and private wires. Neither in the Exchange room is there anything to indicate that this is a great market. Two or three small blackboards display as many Liverpool quotations, while Paris and Berlin quotations are posted on sheets of paper. Chicago quotations at twenty minutes after the opening in Chicago are received at about 4 o'clock. Their appearance excites some interest, to the extent, at least, that every one wants to see them.

During a good season, or a period of healthy activity, an average day's trading on the Liverpool Exchange will amount to 1,500,000 bushels. At such times a quarter of a million may be traded in without affecting prices. The Liverpool market is growing, but perhaps more toward legitimate business than purely speculative.

It is generally believed around American exchanges that the big traders in America will, when trying to bull or bear the price, send orders here to first influence this market.

When asked if this were true, several members of the Liverpool Exchange said that it is. At times of manipulation in America, big orders will be received here, 400,000 to 500,000 bushels. These will give the desired tendency to Liverpool, with the hope that American markets will be influenced.

The basis for speculative and future trading is the wheat on passage, just as at Chicago it is the wheat in elevators.

Differences in future trades are adjusted in the clearing house, and margins are called daily.

The minimum amount traded in in the Liverpool future market is 5,000 centals or 8,333 bushels.

The Liverpool "spot" or cash wheat market is in a large room adjoining the Exchange room; and it is an important market. The room is crowded with small tables or stands, on which samples are displayed. The market is held only twice a week, on Tuesdays and Fridays. On these days millers come from all parts of the northern half of England to buy wheat and other grain.

The grain sold here may be in warehouses or elevators, or in steamers just arrived, or it may be on the quay, just unloaded. Wherever it is, it will be sacked, 250 pounds to the sack, for shipment.

Wheat is unloaded from the steamers in bulk on the quay, when it is to be shipped inland. It may lie there free of charge for three days. The cost of sacking and placing on carts is ¾ cent per bushel, which is paid by the buyer.

There is a large speculative business in the Liverpool market; but, unlike in America, speculation is confined to the grain trade. In fact, this is true of all European markets except Budapest. But while the "outsiders" or "the public" are not interested in the wheat markets, they speculate heavily in stocks, as is attested by the active markets of London, Paris and Berlin and the smaller stock markets of Hamburg, Vienna, Budapest, Genoa, and other cities.

As a matter of fact, the grain import business is

largely speculative. Cargoes of wheat are bought, by the great importers, in America, Argentina, Australia, Russia or India, and the grain will be from one to four months on the ocean. It is an absolute impossibility for the importer to turn around and sell his cargo at a profit the instant he has completed his purchase. It is therefore a speculation, although the business is absolutely legitimate; but the risk is greater than many a mere speculator would care to take.

Short selling is also a feature of the market. Dealers, knowing that wheat is always on ocean passage and that it can be bought at some price, will sell wheat of standard grade and quality to other dealers before they have themselves bought it, expecting to buy it cheaper. Having made the sale, they will, in due time, set about to buy the wheat from some importer who wishes to sell his cargo before it arrives, or from some other speculator. The purchase is made either at a profit or at a loss, and in due time the man who sold short will deliver the actual wheat, if he has not himself passed the transaction along to still another speculator. Eventually, however, some bona fide purchaser receives the actual wheat.

The basis, or contract grade, for all trades was, until June 1st, 1907, Manitoba No. 1 hard, and the quotations seen in any part of the world for Liverpool May wheat, for instance, indicated that variety and grade.

This wheat was never delivered, however, nor was it expected. It was merely used as a basis or standard. This was designated as A grade. There were three other grades, B, C and D, each with several subdivisions, any one of which might be delivered on contracts at a certain difference in price.

On June 1st, 1907, however, the contract grade was made "Red Wheat" (Liverpool grade). The terms of contracts of the Liverpool Corn Trade Association are "subject to a mutual allowance for superiority or inferiority as fixed by the grading committee, but not exceeding one penny per cental" (100 lbs).

That is, while several varieties of wheat may be delivered on future contracts, no grade or variety shall command a premium or suffer a penalty of more than 1d per cental, equal to 1 3-16 cents a bushel.

The varieties of wheat deliverable on contracts are as follows:

"American Wheat—

"If of the type known as Manitoba, basis of weight 60 lbs. per bushel.

"If of the type known as Northern (grown in the United States), basis of weight 59 lbs.

"Any other type of spring wheat, basis of weight 60 lbs.

"Soft winter wheat, free from garlic, basis of weight 61 lbs.

"Hard winter wheat, basis of weight 60½ lbs.

"Argentine Wheat—

"Rosario: Santa Fe type, basis of weight 59½ lbs.

"Bahia Blanca type, basis of weight 61½ lbs."

The rules of the Exchange say that—

"All description of wheat must be reasonably clean, and spring wheats must be reasonably hard of their respective types.

"American wheat must be wheat grown east of the Rocky Mountains in the United States of North

America and (or) Canada, except where otherwise provided."

The business of inspecting and grading wheat is done by a committee, which is elected by the directors. The grading committee consists of fifteen members of the association, six of whom, but not more, may be directors.

The wheat grading rules read in part as follows:

No wheat shall be graded which, in the opinion of the committee, has any defect which would render it unsuitable for general milling purposes.

When the minimum weight for each description is barely exceeded, only occasional smutted, frosted, sprouted or heated grains shall be admitted, but in proportion to the improvement in weight and other requirements, a somewhat larger quantity of smutted, frosted, sprouted or heated grains may be admitted. Undue prominence must not be given to weight alone.

No wheat weighing more than one pound per imperial bushel under the basis weight shall be graded.

The allowances, if any, shall be in gradations of not less than one-half penny per cental.

To determine the relative difference in prices between Liverpool and American markets, is now simpler than under the old rule, when the contract price had as its basis an impossible grade. Assuming that the contract grade in Chicago would be accepted on contracts in Liverpool at the contract price, it is not difficult to arrive at the relative difference between the two markets. That is, approximately; for the rate of exchange and other factors will cause some differences.

Liverpool quotations are per cental or 100 pounds. A quotation at 6s 6d, say, with exchange at $4.84, or 24.2 cents per shilling, is equal to $1.57 3-10 per 100 pounds, or 94.4 cents per bushel.

With July wheat in Liverpool at 6s 6d, or 94.4 cents, Chicago July would be around 80 cents, if American wheat were approximately at an export basis.

The difference between the two markets ranges from 7 to 17 cents, and even a smaller or a greater difference may result from unusual conditions. For instance, one day in February of 1908, due to financial depression in the United States, Chicago May wheat sold 18⅞ cents under Liverpool.

CHAPTER XIV.

THE LONDON GRAIN MARKETS.

THERE are two distinct branches of the grain trade in London, and two markets or exchanges. The Corn Exchange in Mark Lane street, originally known as the "corn market," is the market for "spot stuff;" that is, grain or flour on the spot, in vessels just arrived or in warehouses on the docks. The transactions are all of a jobbing nature—in "parcels" consisting of 1,000 to 10,000 or more sacks (280 pounds) of flour, or 1,000 bushels and upward of grain.

The other market is the "Baltic," i. e., the Baltic Mercantile & Shipping Exchange. This is "the home of floating cargoes," and its members buy grains, and other products in the markets of the world, for shipment to London in cargo lots. The entire cargo, however, is not necessarily all the property of one house.

There has evolved from the Baltic grain market, of necessity, the Corn Trade Association, which is probably one of the most perfect-working and useful trade organizations in the world. It has established uniform contracts for use with the different grain exporting countries, it fixes the standard of grades, except with America and Canada, and arbitrates all differences between buyer and seller.

There is no "future" market in London similar to the pit of the Chicago Board of Trade and other American exchanges. Both the Baltic and Mark Lane had future markets, where hedging and speculative trading was

done, until a few years ago, or until America ceased to be a large exporter of wheat. American wheat was at that time the basis for trading. Now, Argentine or "Plate" wheat is the standard in London.

Mark Lane, as the grain and flour market or Exchange is frequently called, is known around the world wherever grain is sold for export. It is, in fact, the court of last resort in the matter of prices; for London buys the surplus from the heaped-up and running-over bins of the world. It is a fact that wheat, and flour, too, can usually be bought cheaper in Mark Lane than it can, freight added, in America, Argentina, Russia, India or Australia. The reason for this is that London has no elevators, and only limited storage facilities for grain; it is a consuming market, and stuff must be sold and moved along on arrival. London, therefore, represents the bedrock-price basis, although this fluctuates from time to time, regardless of other conditions, as arrivals are heavy or light.

Mark Lane is both a street and a market.

The present home of Mark Lane is rather an unpretentious building, in Mark Lane street, and was erected in 1879. The trading room is large and well lighted, but not heated. In the winter months the members wear overcoats.

Large samples of grain are displayed in bags, in the trading room, or exchange. One may here see samples, representing late arrivals in London, of various grades of wheat from India, from Russia, Australia, Argentina, from our own Pacific coast, Canada—in fact, from every country that exports grain. Likewise, standing side by side, are samples of corn (maize) from different parts of the world, and oats and other grains. Flour from

every exporting country is also offered here, and it is easy for an American to find some familiar brand.

Mark Lane is an open market. That is, anyone may come here to buy grain or flour, without being a member or paying a commission or brokerage. But only members have the privilege of selling, for which they pay 21 guineas annually. The standholders pay a rental for their stands. There are but three market days a week on Mark Lane — Monday, Wednesday and Friday. The room is open on other days, but there is no regular market. The market opens at 11 o'clock and nominally closes at 3:10, but trading continues all the afternoon, or as long as traders desire.

Among the grain markets of the world, London is unique. It is the greatest consuming market, a non-speculative market, and one whose influence is almost always downward. It might be said that there are no London prices, for there are none that serve as a guide to what the market price is. In fact, the market price of grain in London is what the stuff will bring at forced sale. All sales are forced in London; at least, this is not much of an exaggeration.

This condition in a great market towards which wheat and flour from all parts of the world are headed, gives this market an influence peculiar to itself. When the market is congested with wheat and flour, English millers buy wheat at their own price, and this draws buyers away from Liverpool and Hull. This affects Liverpool quotations, which are regarded as a barometer for prices. London is congested oftener than it is bare of supplies.

London buyers of cargoes can be classed among the shrewdest buyers in the world. They have got to be to

continue in business, for they buy months before the stuff can arrive, and do not hedge their purchases, as is the custom in America. This means that they buy at very low figures and with every possible chance of variation of grade or condition in their favor. The result is apparent in the London market, where, as has already been said, spot stuff can be bought cheaper than stuff to arrive, in part due to relatively cheap purchases.

The influence exerted on the other grain and flour markets of the world is unquestionably bearish.

The Baltic occupies a new and magnificent building in a short street called St. Mary Axe, not far from the Bank of England, or "the Bank," as it is commonly called.

The Exchange room of the Baltic is handsomer than that of the Minneapolis Chamber of Commerce, which is the finest in America with the exception of the New York Stock Exchange. Furthermore, there is a comfortable reading room, with all the London daily and weekly papers and books of trade statistics. There is also, in the basement, a lunch room, for which the Exchange room is sometimes nearly deserted at the noon hour.

The hours of the market at the Baltic are from 10 until 4, but the market is in reality from 11 until the members get ready to go home, which may be 6 o'clock. There are no limitations on the hours of trading. If a cargo arrives late at night it may be sold over the telephone early in the morning. Likewise, business may be transacted in the evening, or on Sunday, without any bothersome restrictions such as American exchanges hedge their members about with.

Although many features of the London grain trade

show a tendency to cling to old customs, there is something of uptodateness about the Baltic that must impress the stranger. Perhaps it is the beautiful building, or possibly that the rooms are comfortably heated—a great treat in London—or that the members are well dressed and businesslike in appearance. Or it may be all these combined.

When cargoes (100,000 to 175,000 bushels) of grain arrive in London they are within the jurisdiction, so to speak, of Mark Lane, for then they become "spot stuff." But when they are purchased at some foreign port and are en route they are the property of members of the Baltic and are subject to the rules and contracts of the London Corn Trade Association, already referred to.

Russian wheat, which is shipped in bulk, is bought by sample. There can be no well-defined grades, owing to lack of terminal elevator facilities in Russia and to the primitive ways of gathering enough wheat together to make up a cargo.

Nor is the custom of buying by sample anywhere near satisfactory. For example, a grain exporter has part of a cargo of wheat, or other grain, made up. He sends a sample to London buyers that may fairly represent the quality of the whole. But to fill out his cargo he may be compelled to take what comes along after his sample has been made up. This may be inferior to the average, and so reduce the quality of the whole. How such differences are adjusted will be mentioned further on.

London buys wheat from India "on standard," and the grain is shipped in bags. Eight or ten exporters in India control the trade of that country. London importers buy a cargo of Indian wheat for, say, May-June

shipment, at an agreed price. The importers have no idea of what the quality of the wheat will be, although there are certain established grades and varieties in India, such as No. 2 club, Calcutta, and others. The importer, however, buys his wheat, whatever variety it may be, "F.A.Q." That is, "fair, average quality." The standard, which serves for a basis, is made up by the Corn Trade Association.

Argentine wheat is also bought "F.A.Q.," or more strictly, subject to "fair average quality" terms or agreement. But, furthermore, it is bought by sample and to be of a certain natural weight. Should it fall below this weight more than a certain allowance for shrink age, the contract is not void, but the buyer is allowed the difference as adjusted by the Corn Trade Association.

American wheat is bought on certificate of inspection of the exchanges—Duluth, Chicago, New York or Philadelphia. Canadian wheat is bought on government inspection.

It is very apparent that there must be wide differences to adjust in grain bought in distant countries, where it is impossible to have established grades. Until the formation of the London Corn Trade Association there was continual and almost endless arbitration. Now, the contracts of the association are generally acknowledged, and its adjustment of differences is final.

The three most important features of the work of the association are, the devising of a contract that could be adopted by the trade; arbitration and adjustment of all differences, and the collecting of samples from every cargo shipped from any port in the world, and by means

of these, establishing standards and grades. These form the basis for adjusting differences.

For instance, samples of the grain in every cargo shipped from Black Sea ports are, by arrangement with the captains of vessels, secured by the association. Some from each sample is then taken and a mixture formed which shall be the standard. Thus a grade is established, each month, which purchases by importers must match. When a cargo arrives in London, the association secures a sample or samples, which are compared with the standard sample. If the cargo falls short, the importer is allowed such a difference as a committee of arbitration of the association may decide upon. This adjustment is final.

Samples of shipments from India are likewise secured, and a "fair average quality" standard is established each month. So it is with exports of grain from all ports of the world, excepting America and Canada.

CHAPTER XV.

THE ANTWERP GRAIN MARKET.

THE Antwerp grain market is unique, when compared with American markets, in that there is no trade organization; no grain exchange with a membership fee. It is an open and free market. Neither are there any official quotations or prices, for there is no one to say what shall be official; nor is there any "future," "term" or option market here. It is a cash market, trading in the actual grain by men who have it to sell or want it to sell again or to grind. The only feature resembling an organization is an arbitration committee.

The members of the grain trade, or representatives of the various grain houses or mills, meet at the Bourse every business day at 2 o'clock, and remain until 3. This meeting is for the conclusion of business that may have been begun in the morning. It affords buyers and sellers an opportunity to get together to close contracts after canvassing the situation during the forenoon. Then, too, out-of-town millers and grain buyers come to the Bourse for the purpose of meeting the sellers.

During the forenoon the salesmen of the importing houses are busy calling or telephoning to buyers. Of course, some business is concluded in this way, but as a rule the buyers, after getting prices, etc., prefer to wait until the meeting at the Bourse to make their purchase.

The Bourse is owned by the city, and anyone may transact business here on payment of a small sum annually. Excepting from 2 until 3 o'clock the doors are

open. Between 2 and 3 the entrances are guarded by policemen and it costs every one who has not an annual membership ticket, 1 franc to enter. Members of different trades meet at the Bourse at this hour, but half the large exchange room is occupied by the grain trade.

The exchange room, which is practically the whole of the Bourse, is a beautiful chamber. The galleries on the four sides, and columns extending to the roof, half of which is a great skylight, all with an artistic touch to the decorations, form a decidedly pleasing effect. It is one of the finest exchange rooms in the world.

During what may be called the session at the Bourse, the room is densely crowded, particularly on Wednesdays and Thursdays. All business transacted is of a private nature. There being no organization, there can, of course, be no record kept of prices nor anything else. In this respect the market is of the most primitive nature. It is merely a coming together of business men to buy and sell, without restrictions, limitations, or rules.

Having no future market in which to hedge their purchases, the large houses must buy relatively cheaper than they would otherwise—as near as possible to a bed-rock basis. The large mills of Belgium are owned by stock companies, and the managers are not permitted to take chances on the market. When they cannot sell flour they do not buy wheat. Under such conditions the hazards of the grain market are neither more nor less than those of any other merchandising business.

Asked what constitutes the basis for prices in the Antwerp market, a large importer said:

"Offers of wheat from the Danubian country and the Argentine; offers from millers, stocks, the amount afloat, the movement in America and Canada, and crop

conditions the world over—these form the picture of our market.

"Of course," he continued, "the Berlin and Liverpool markets have an influence, and New York and Chicago are closely watched during years of normal crops in the United States. But American prices are not regarded as an expression of trade opinion. There is too much manipulation in those markets."

A dozen or so years ago there were many big speculators in Antwerp. They traded in the Liverpool, London and New York markets. This has practically all ceased, however, and any grain speculation there may be is more in the nature of a commercial chance that every merchant is bound to take. Of course, when an importer buys a cargo of wheat in Argentina, it is, after a manner, a speculation; for he does not know when he will sell it, to whom, nor at what price. Yet the same might be said of the merchant who buys a bill of goods.

The dividing line between speculation and what is called "legitimate" business is, after all, like the line between two states—it is not visible.

CHAPTER XVI.

THE PARIS GRAIN MARKET.

THE grain market of Paris is at the Bourse de Commerce, where there are also other markets, chief among which are sugar and spirits, not a bad mixture. "The Bourse", or Stock Exchange, occupies a large building of its own some blocks away.

The Bourse de Commerce is a peculiarly-constructed building of circular form. The exchange room is of great height, extending from the ground floor to a dome some four stories above. The "spot" grain market and the sugar market are in the exchange room, the latter having a roofless canvas enclosure. The sugar market is a very important one. The spirits market and the grain future market are in an adjoining room. There are no pits, as in American exchanges, but the traders form in groups, one for each market, much the same as in the American exchanges. The two markets are about equally active at times.

A feature of the grain future market is the "establishment of prices" at 3 o'clock. The official length of the session is from 1 to 3 o'clock. At the latter hour the traders and brokers, 100 to 200 in number, form in a large circle while an official calls for bids and offers on the different grains and grades. In this way official prices are established. Trading may continue unofficially the remainder of the afternoon. A large part of the grain business is done outside. The Bourse de Commerce has direct telephone connections with London,

Antwerp and Berlin. Paris is not a great grain market, nor are there any in France. At times it is a speculative market of some importance. There are no extensive lines of elevators, as in America, nor big terminal elevators.

CHAPTER XVII.

BERLIN GRAIN EXCHANGE.

BERLIN, the chief city of Germany, has an important grain exchange and its wheat quotations are sent out over the world; but the market has not its old-time importance. At the present time the Berlin market for trading in futures is only a local one, representing or reflecting the crops of Germany, whereas, some years ago, it was of international importance. Then, the big traders of Russia, England and France, as well as of Germany, traded here, and there was a broad, active future market. Then, too, Berlin was an influential factor in making prices for the markets of other countries. Now, however, Berlin looks to Chicago and New York and somewhat to Liverpool for its market guidance aside from local conditions. Its future market is small and it does not attempt to be a leader.

This change was caused by the coming into power of the political party called the agrarians—so called because they represent the agricultural interests. Having a majority in the reichstag, they passed an anti-option bill. The law now (it was more drastic at first) prohibits trading in grain futures by any but members of grain exchanges and only then when actual delivery of the grain is intended. This placed grain speculation in the same class with common gambling, and made accounts uncollectible by law, the same as gambling debts. Margins or money advanced on such accounts can even be recovered. The effect, of course, was disastrous to

the grain market of Berlin. Another effect was that it increased speculation in stocks, for if the public wants to speculate it will find a medium.

But the contention of the agrarians was not regarding the right or wrong of speculation, but the price of wheat. They claimed that speculation in wheat and other grains tended to increase the importation, and so depressed prices. Therefore, they stopped public trading in grain, and, furthermore, placed a heavy import duty on all grains. But, ever mindful of their own interests, they neglected to place a duty on mill feeds; for the farmers are large users of these. The selfishness of the whole proceeding is apparent from the treatment of the products largely used by their constituents.

Despite the ban placed upon trading in wheat futures, a future market still exists on the Berlin Exchange. The trading is limited, to be sure, but there is speculative trading.

The letter of the law is avoided by making all contracts or trade "for actual delivery." But if a member of the Exchange buys 5,000 bushels of wheat for, say, May delivery, and sells it to some other member before delivery day, it cannot be shown that actual delivery was not intended.

The Bourse of Berlin is a splendid building, but, unlike those of Hamburg, Amsterdam, Antwerp, Paris and most other European cities, it is owned by an incorporated company and not by the city.

There are three moderately large exchange rooms, separated only by rows of pillars. Two of the rooms are occupied by the Stock Exchange and the third by the Grain Exchange. Visitors are admitted and may walk at will about the floors.

The official hours of the Grain Exchange are from 12 until 2, but there is an unofficial session from 10:30 to 12 and from 2 until 2:30, corresponding to a "curb."

Trading in futures is done through a few brokers, and the proceeding is somewhat the same as that of the London Stock Exchange. That is, a member of the exchange will go to a broker to buy or sell wheat. The broker will give a quotation at which he will trade, though he may or may not have an order. If a broker is responsible beyond question, the member trading with him will not ask him to give up his principal's name. This enables the brokers to do some trading on their own account.

The official quotations of the different grains are given out three times a day, at the opening and close, and one intermediate quotation. These quotations are settled upon by what are called "sworn brokers," 60 in number, who are really the representatives of the agrarians. There being no pit nor open trading, trades may be made at many different prices; so that it is necessary to have some one to declare what shall be official.

So far no mention has been made of what in America is known as the "cash grain" market, and in London, the "spot" or "cargo" markets. Yet the cash market of the Grain Exchange is very important.

This market may be divided into two branches, one for the native crops and the other for the imported grains.

The business of those who handle the native grains is to buy from the country dealer and distribute throughout the empire to mills and other buyers.

The importers bring into the country, via Antwerp, Rotterdam and Hamburg, grains sufficient to make up

the deficiency of the home-grown products. This deficiency is very great, for Germany annually imports from 70,000,000 to 80,000,000 bushels of wheat, 30,000,000 to 35,000,000 corn, 20,000,000 to 40,000,000 of oats, 20,000,000 to 35,000,000 rye, and 40,000,000 to 70,000,000 barley. This is in addition to the home production of a billion bushels of all grain.

Berlin is the principal market for native grains and headquarters for some large importers. Therefore it is the natural market for many millions of bushels of grain.

Much of this business is done at the sessions of the Grain Exchange, though business is transacted at the offices of the members before or after exchange hours.

The Bourse is not a center around which the members have their offices. Some of them are across the city, in semi-residence streets. Here, to some extent, and in Antwerp and Amsterdam to a much greater extent, some large business houses have their offices in the houses in which they live, following an ancient custom. It is about as hard to gain admission to some business offices as it is to a private residence. You are regarded as an intruder, and the servants inspect you suspiciously. A letter of introduction is often a necessity in order to see a member of a firm.

Terminal elevators are badly needed at Berlin. The trade realizes it, and attempts have been made to have a large terminal built. However, private parties are evidently afraid to venture, perhaps fearing the agrarians; while the government has not as yet seen fit to do anything. But the need is so pressing that some means will doubtless be found to furnish the desired storage.

The business of buying the native grains in the country is done by independent dealers. There are no

large "line" elevator companies, as in America. Water transportation is much depended upon for moving the grain, the great canal and river systems making this practicable.

The papers of Berlin and other German cities give fully as much space to the grain markets as Western American papers and more than the New York or the London papers.

A small sheet is published daily in Berlin, printed on one side only, devoted entirely to foreign markets. It gives a good review of the Chicago and New York wheat markets, with quotations of wheat, corn, oats and linseed. Toledo, St. Louis and Duluth quotations are also given, and New York flour prices. Weather conditions and brief crop news are also printed.

These foreign markets are eager for crop news from other countries, but the trade does not seem to understand how to gather news locally, nor the value of it close at home.

CHAPTER XVIII.

THE BUDAPEST GRAIN EXCHANGE.

BUDAPEST has a new Stock and Grain Exchange building, built in 1905, called, of course, the Bourse. Unlike that of most European cities, it is not owned by the city, nor is it a free exchange. It is owned by the Budapest Stock & Grain Exchange, which is an incorporated body. The ground and building cost approximately $1,500,000. The Grain Exchange has a large membership. There is, besides the market for cash grains, a big future or term market. To trade in this, dealers must belong to the Future Agents' Association. The market more closely resembles that of American exchanges than any other market in Europe. Future trading is in wheat, rye, oats and corn, and the unit of trade is 100 tons, about 3,700 bushels, except in rye, which is 50 tons. The unit in American exchanges is 5,000 bushels.

The Bourse faces a public square, a beautiful little park. On the opposite side is a magnificent new bank building, and other fine buildings surround the square on three sides. On the ground floor of the Bourse, under half the building, there is a restaurant; but the sidewalk, on one side of which is grass, flower beds and shrubs, is used for the tables in good weather. The Bourse and its surroundings are the most pleasing to be found in such associations in either Europe or America; they are, in fact, ideal.

During the early spring of 1907 the wild fluctua-

tions and the phenomenal advance in the Budapest wheat prices attracted unusual attention in the markets of America. About all the information forthcoming at the time was that the advance was due to speculation. Budapest is a local market, representing conditions in Hungary; so the advance had only a sentimental effect on other markets. But the cause—crop damage in Hungary—was of international importance.

The following brief and quaint description of the market during what was probably the most phenomenal advance in its history, might have been written of Chicago. It was written by a member of the Budapest Grain Exchange. The letter follows:

"Concerning the movement of our Exchange, I will give a description, and an explanation also, of the cause (Winter-killing of the crop and unfavorable spring weather).

"Now everyone began to buy, and bought the more willingly the higher prices mounted. Some speculators, whose accounts at first made but a small business for the broker, became first-class customers on account of their previous gains. The broker bought for their account more and more. The sellers were not any more speculators *a la baisse,* but those who wanted to secure their share, not doubting that wheat might go higher still. Seeing that prices still advanced, the first buyers, who had a realized profit in their pockets, began buying again, and so on.

"The behavior of this excited crowd was sometimes worth looking at. It took physical strength for the broker to do his business, and some people who were not strong enough to push and shove, did not get to fulfill their orders. There were moments when one called out the price 10 hellers (½c) cheaper on one side than someone wanted to buy on the other; but there was no possibility to get to each other. But who cared for such a trifle of a difference!"

CHAPTER XIX.

PESTS AND CALAMITIES.

WHILE there are less than half a dozen species of insects that are factors in crop damage, and none of these occurs with any great frequency in sufficient numbers to cause widespread damage, the weather is always with us, and some phase of climatic conditions is responsible for a loss of many millions of bushels of wheat every season. It may therefore be said with positiveness that the weather, directly or indirectly, has more influence on prices than any other factor or of all others combined. For the price is not only influenced by the damage actually done, but also by the apprehension lest damage should be done.

The losses that occur in America as the result of unfavorable weather conditions are, when considered, really appalling; for sometimes they amount to 100,000,000 bushels in a season. And it is undoubtably true that a considerable percentage of such losses might be avoided by means of better agricultural methods, better seed wheat or seed better adapted to the particular locality in which it is sown. Yet it is also true that even in France and Germany, where good farming is the rule, losses are heavy. The crop of France, for instance, may decline 15 per cent. from one season to another as the result of adverse weather. In Russia, where poor farming among the peasants is general, one is not surprised at heavy crop shortages; and yet the percentage of loss is little or no greater than in countries where

better agricultural methods are followed. Hungary, for example, a country of advanced agriculture, in 1907 suffered a decline of 73,000,000 bushels from the previous crop, or 36 per cent. As the 1906 crop was an unusually large one, however, it would be unfair to charge all the loss to climatic conditions, though the season of 1906-07 was an exceedingly unfavorable one. It may be said that the tendency is almost invariably to overestimate crop damage, or to believe that the damage is greater than it really is; and as a result prices seldom remain long at the high levels to which they are often carried by crop scares.

It is probable that the greatest loss to wheat is caused by unfavorable conditions during the winter months; the grain is "winter-killed". This is particularly true of the central states, of Germany, France, Hungary and southwestern Russia. The loss may be occasioned by a winter too mild, by extreme cold with no snow on the wheat fields, or by repeated freezing and thawing. Sometimes a solid covering of ice is also responsible for great damage. The winter of 1906-07 was a particularly bad one in Europe, when a combination of adverse conditions occurred.

Late frosts in the spring are always looked forward to with apprehension, but serious damage from this cause very rarely occurs.

Considering crop damage due to adverse weather conditions, chronologically, the effects of a late spring may be mentioned next. Of course, damage from this source is indirect. But first, a late spring has the effect of reducing the spring wheat acreage, and so the size of the crop. While this is not damage nor loss, as the farmers sow other grain, it is a market factor.

While a late spring may not always result in damage to wheat, it places obstacles in its way, both for spring wheat and winter. Owing to the late start, the grain is not advanced as far as it should be when the extreme summer heat comes; and a few days of excessive temperature when the wheat is in the milk may cause the loss of millions of bushels.

A late spring may also result in spring wheat not maturing in time to escape early frosts. The crop of 1907 in the Northwest and in the Canadian West was a particularly unfortunate example of this kind. Wheat in eastern Russia sometimes suffers in a similar manner, and the crop in the southern part of agricultural Argentina will be menaced more and more as development is pushed southward. Seasons of severe damage by frost are, however, widely separated.

Another bad effect of a late spring in the spring wheat countries may be to delay harvest until the usual fall rains begin; or, even if the harvest escapes, great damage may result from the grain being exposed in the shock during a period of rains. The crop movement will also then be delayed; and this is a market factor.

Too much rain frequently results in considerable damage, and occasionally in a great deal. The damage, except after harvest, is mainly confined to low lands, where the grain is drowned out. The amount of rainfall that growing wheat will survive, if the land is not low, is surprising; and seldom is wheat seriously damaged unless actually drowned out.

Extreme heat is the cause of extensive damage at times, and one, two or three days of merciless sunshine, when the earth bakes and the foliage hangs limp, without a breath of air to stir it—such a period will blight

millions of acres of wheat. The kernel will be shrunken, and the loss may be reckoned in millions of bushels. The area affected may extend over several states. Such a period of heat is also a market factor, and may add 10 cents to the price of wheat in less than a week.

Extreme heat early in the season may cause a great deal of damage to winter wheat; and the spring of 1907 offered a notable example in the Southwestern states, Hungary, Roumania and Russia. Damage at that time is, of course, impossible to estimate.

Drouth, particularly when accompanied by extreme heat, probably takes second place, or next to winter-killing, in the amount of damage to wheat. While most of the wheat-growing countries suffer seriously at times, India, Australia and eastern Russia are the greatest sufferers. However, there is a semi-arid strip in the Western states and Canada, extending from Texas well into western Saskatchewan, that has seasons of extreme drouth.

In 1902, as a result of drouth, the crop of Australia dropped from 42,500,000 bushels the previous year to 19,800,000 bushels, while the 1903 crop was 75,000,000. Such a percentage of loss was phenomenal and perhaps without precedent; and should a similar one occur in Russia or India, the result in suffering and loss of life would be frightful. Such a large percentage of loss in Russia or America would demoralize commerce.

The 1902 crop failure in Australia resulted in a heavy demand for wheat and flour on the Pacific coast, and large quantities of flour were even purchased in Minneapolis for Australia. The price of wheat on the Pacific coast was advanced until far out of line, relatively, with Liverpool.

The effect of drouth is perhaps the most difficult of all damage to estimate. Early drouth and heat combined may cause a practical failure, as it did in eastern Russia in 1906. Or, again, the effect may be overcome and a good crop raised, as was the case in Kansas in 1907. However, there was much cool weather in the spring of 1907, and no prolonged period of heat. When favorable weather finally came, the grain developed and grew better than seemed possible. And that is why the effect of drouth is difficult to estimate. For instance, farmers and grain dealers will say, "If rain does not come within three weeks, the crop will be ruined." In four weeks, no rain having fallen, they will say, "We will not raise three bushels to the acre." In five weeks the crop is gone and the farmers are about to plow up their fields, or offer to sell the crop for a dollar an acre. Then it rains. The spindling stalks develop good heads but few leaves; and finally the crop is harvested and threshed. Then great is the surprise of every one to learn that the wheat yielded 18 to 25 bushels per acre.

Rust, while not a climatic condition, becomes a factor in crop damage as the result of certain weather conditions. The countries that suffer most from rust damage are the United States, Canada, Hungary and Argentina; and as rust is present every year, some crop deterioration every season is doubtless due to rust. Considerable damage every year is also due to smut.

Hail as an agent of destruction is the most thorough of them all, chopping the heads of grain to pieces, beating down the grain and leaving the fields looking as though a drove of cattle had passed through them. Fortunately, hail damage is always of a local nature; and while a strip two or three miles in width by twenty in

length may be destroyed, the total damage during a season is not of sufficient magnitude to affect prices. Hail insurance in the Northwestern states and Canada is now a recognized feature of the annual farming expense, and saves many a farmer from a heavy loss.

REMARKABLE INSTANCES OF GREAT DAMAGE.

Several instances of great damage to crops in America from what are called "natural causes", but which, nevertheless, were abnormal manifestatitions, have a promient part in trade history. Yet the first one that will be mentioned is not of interest from a market point of view but rather from a climatic or meteorological. That is, the floods in Kansas in 1904; and which, as they were without precedent except in Indian legend, their equal may never occur again. Yet there is also something of agricultural interest in the manner the hard winter wheat withstood the adverse conditions.

The actual damage caused by the rains during the latter part of June and by rains and floods from July 1st to the 10th of that year, was over 25 per cent. of the wheat crop, amounting to some 25,000,000 bushels, besides damage to other grains. The writer visited the state about July 10th, and traveled through the principal wheat counties, for the purpose of observing the effects of the rains, and the following account was written while there:

"Owing to long continued general rains the earth was saturated and the streams swollen by the last of June. Then for ten days the rainfall was heavy. At Wichita it was from five to six inches and in some parts of the state ten inches. The streams generally overflowed their banks, while ponds were formed in every

depression. Fields were inundated and wheat, corn and oats drowned out and destroyed. Some entire fields of grain were completely devastated and in some counties almost 50 per cent. of the wheat crop is a total loss.

"Such loss—that is, total destruction—has, however, been largely overestimated. After careful inspection of the principal wheat territory since the floods, the writer places the direct loss at 15 per cent of the total crop—12 per cent. for the hard wheat and 3 for the soft. In addition to this there is a large indirect damage.

"The next most serious loss (it probably amounted to 10 per cent.) is due to shrinkage of the berry, sprouting in the shock, and the bleaching of the uncut grain. Sprouting is not general in the shock, only one or two bundles in the largest shocks being affected. Yet much of the shocked grain is discolored and most of it is of light weight. Practically all the grain is bleached. There will be some 60-pound wheat and some 62-pound; but the crop will probably range from 54 to 58 pounds per bushel. This estimate is based on threshing returns as far as available, and from tests from samples. These figures indicate a loss of four pounds per bushel, or 6½ per cent. of the crop.

"A surprisingly small amount of grain will be lost in cutting and handling the remainder of the crop. To see this wheat standing, dead ripe, in the fields, and with an almost torrid sun beating upon it, one would naturally expect a large loss from the shattering of the heads. Yet, owing to the toughness of the grain, such loss will be slight—not over 2 per cent.

"Since the weather has cleared, harvesting and stacking have been as general as the fields would permit. Some fields and parts of fields are still too wet,

but the last of the grain will have been gathered by August 1st, with favorable weather. Some fields which, ten days ago, were thought to be worthless, will yield good crops."

"But for one factor Kansas would have suffered a total loss of 50,000,000 bushels of wheat, besides damage to the remainder of the crop. The one fortunate circumstance that saved to the state this great amount of wheat was that almost the total crop was of the 'Turkey', or hard winter variety. This wheat, during a period of adverse conditions of unusual length, has withstood the elements in a manner no one could have foreseen. Beside frequent and almost continuous rains early in the summer—and in parts of this state no moisture at all during the winter—deluge after deluge came upon the ripened grain the first ten days of July. These rains broke down the red wheat and the oats, bent over the heads and hammered them to the earth as easily as the wind drops the autumn leaves after a frost. By the first of July fully 75 per cent. of the wheat was uncut and was, therefore, at the mercy of the elements; yet when the sky cleared on July 12th, the wheat that had not been forced down by the overflow of the streams, was upright, only awaiting dry weather to be harvested. The heads were bent over, but not to the ground; and the straw was tough and unbroken. No other wheat grown in America could have withstood what the Turkey wheat did; nor, until this, was it known how much grief it could stand up against."

CHAPTER XX.

PESTS AND CALAMITIES (Continued).

INSTANCES OF GREAT DAMAGE BY DROUTH, RUST AND FROST.

As a result of the drouth during the spring and summer of 1900, the three great spring wheat states, Minnesota and the Dakotas, suffered a loss of at least 60,000,000 bushels of wheat; the Department of Agriculture even estimated it at over 100,000,000 bushels. This is doubtless the greatest crop loss within the same area that has ever occurred in any part of the world; and as a market factor it has had few equals, though its effect was mainly local. It "set the Minneapolis market on fire", and in an incredibly short time and before the commercial world realized what was happening, the price had advanced nearly 25 cents. Early in the year Minneapolis July wheat sold as low as 60⅝ cents, while at the top of the bulge 92½ cents was recorded.

The spring rainfall had been deficient, and until the first of June scarcely any rain had fallen over the Northwestern wheat country. Vegetation stopped growing and withered, and the pastures were as brown as in November. Damage was reported from all quarters. Every day increased the apprehension. When there had been no rain up to the second week of June, there was a great scare.

The result was that the Northwestern farmer, who could look into his own fields and see his wheat drying up, sought to make up a part of his loss in the market,

and so rushed to the nearest town where there was a broker's agent and plunged in his own small way.

The bull market that followed was the greatest the Northwest had ever known. During the excitement some of the oldest grain men estimated that Minnesota and the Dakotas would not raise more than 100,000,000 bushels of wheat. Some said 90,000,000. Then a Chicago grain man, after a trip through the country, estimated a maximum possibility for the three states of 80,000,000 bushels.

The Minneapolis pit had never before beheld such a market. The Exchange was filled with farmers and others from the country eager to buy wheat, because of the calamity that had befallen the crop. At that time the Exchange room was not so large as at present, and a special committee had to be appointed to keep the floor clear enough to permit the members to transact their business, and special guards were placed at the doors. The excitement was intense, the nervousness grew daily. A local paper described the finish as follows:

"Meanwhile clouds appeared over the wheat belt, and there was selling that sent the price down; but the cry went up, especially from the farmers who had invested, that it was too late to save much of the crop. Then a certain crop expert hove in sight. From the fields through which he had been tramping for days and weeks, the Minneapolis man sent in an estimate of at least 135,000,000 bushels of wheat for Minnesota and the Dakotas. The bull market was all over. Wheat fell off from 8 to 10 cents almost at a jump", and from around 90 cents the price sold off some 20 cents by autumn.

It is probable that the estimate of 135,000,000 was approximately correct, for the crop movement indicated a much larger yield than the low estimates. However, the figures of the Department of Agriculture still stand at 85,000,000 bushels for the three states. The following year Minnesota and the Dakotas raised 191,000,000 bushels.

THE BLACK RUST YEAR.

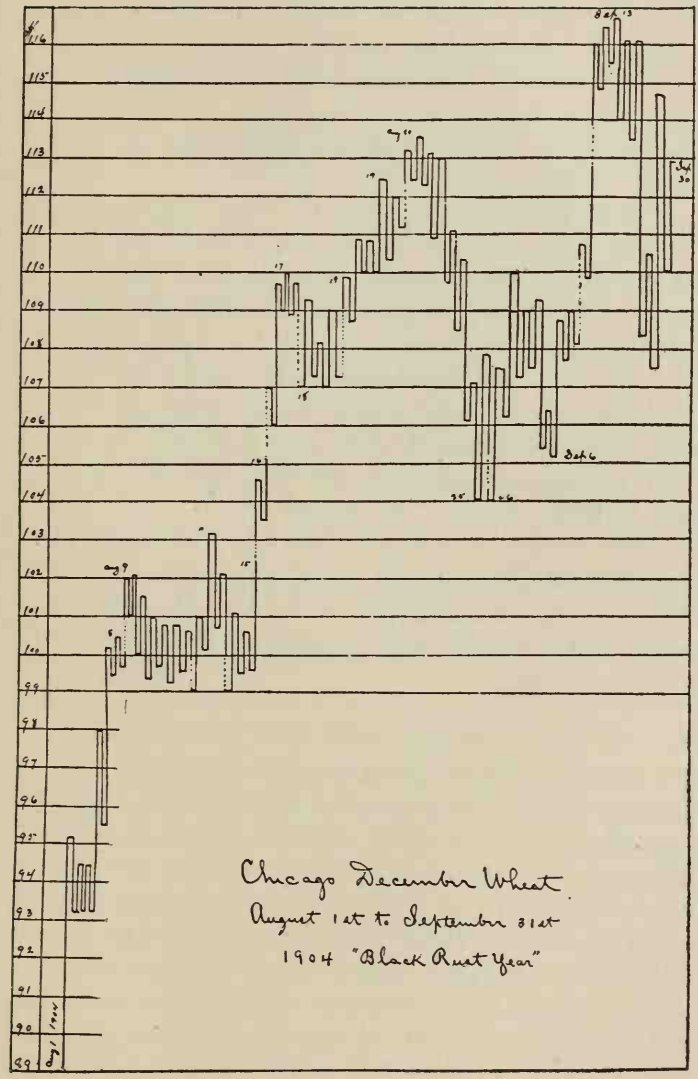
The summer of 1904 witnessed another calamity in the spring wheat country—Minnesota, the Dakotas and Western Canada. Nebraska was also a sufferer. The total loss for this area, including the wheat that was unfit for milling and hardly suitable for feed, was probably 75,000,000 bushels.

As there is rust in the fields every year, members of the grain trade and farmers as well, were skeptical about damage; and the spread of rust that actually did damage was like the spread of a new disease that people would not believe in until they were stricken.

Along toward the latter part of July many of the wheat fields of southern Minnesota and South Dakota had rather an unhealthy appearance, which was ascribed to the somewhat peculiar atmospheric conditions that obtained that season. It is not likely that the crop would have been a full one even without the black rust scourge. Finally, on August 1st, it was discovered that some fields of wheat had become so infected with rust that the heads contained little or no grain; that fields which at a distance appeared promising proved almost worthless on close inspection. The news spread throughout the Northwest, and farmers who had previously had no fears now began to examine their crops. It was then

discovered that many unsuspected fields were badly damaged, while rust in its worst form was on the stalk of grain apparently healthy as yet. A close inspection of fields from day to day revealed a steady deterioration of those that had been attacked. Atmospheric conditions seemed just right for the spread of the rust, and the wheat was at such a stage of growth all the way to Canada that it could be injured. The spread and development of the rust was coincident with the growth of the wheat. That is, the most virulent form of the rust was reached just at the stage of growth of the grain when it was most susceptible to the attacks of the disease. As the grain developed from day to day and as the season advanced farther and farther north, atmospheric conditions favored the rust, and it followed the crop through Minnesota and South Dakota, into and through North Dakota and on to Manitoba, blighting it just as the heads were beginning to fill. Some fields escaped, of course; others were only slightly hit, while others contained so little grain that it did not pay to cut them—just fields of straw with nothing in the heads.

While this wave of destruction was sweeping northward, things were doing in the wheat market. As already mentioned, black rust was reported on August 1st. Chicago September wheat was then at 90 cents. A quick advance followed, and as damage reports began to pour into Chicago from Minneapolis, where great excitement reigned, the price bounded upward and upward; and one of the greatest bull markets in the history of the Board of Trade followed. The Minneapolis Chamber of Commerce had the biggest and broadest market it has ever had; and when the excitement was at its height, there were several days when the pit from 9:30


Chicago December Wheat
August 1st to September 31st
1904 "Black Rust Year"

to 1:15 was a scene of tumultuous trading without cessation. From August 1st to the 20th the price climbed with few setbacks, and Chicago September sold at $1.11, an advance of 21 cents in twenty days. Chicago December wheat sold at $1.16¾ and Minneapolis at $1.20½ on September 13th.

The highest point reached by any Chicago future was $1.21⅛, when May wheat sold there the last of April, 1905. This was due to manipulation, which took hold of the market; and it was believed by many that the price would reach $1.50. Instead, however, it broke in April and in one day declined 10½ cents; and on the 29th Chicago May sold at 87¼ cents. Thus ingloriously ended one of the world's greatest bull markets, which had its beginning in a crop scare, and its finish in manipulation.

Black rust, it may be said, is not a distinct kind of rust, but only a stage of rust development. The ordinary red rust, which is present in the grain fields every year, will, under certain conditions, develop into the black rust stage.

FROST IN 1888 AND 1907 IN THE NORTHWEST.

Twice has the Northwest wheat crop suffered severe damage from frost; namely, in 1888 and again in 1907; and each time the damage became an important market influence.

According to the records of the signal service bureau there was a light frost in Minnesota and North Dakota on August 9th, 1888, and a second and heavier frost on the 17th. For a few days little thought was given to the probable extent of the damage. Then North Dakota began to send reports to Minneapolis, and so

the area affected began to be understood. Buying of wheat in the market followed; and, led by a few heavy local traders, prices began to advance. Reports became sensational and the millers began to fear a very short crop. A sensational market was the result, and in October No. 1 northern wheat sold at $1.20 in Minneapolis, which was the center most under the frost-scare influence.

While the damage to wheat in North Dakota was considerable, there was not the calamity that the millers and the Minneapolis grain trade had believed had occurred. In fact, the receipts of wheat at Minneapolis contained a fair percentage of No. 1 hard and No. 1 northern wheat; and so, instead of continued advancing prices, there was a decline by spring to a normal level. While the actual damage to the crop was really serious by reason of the amount of wheat rendered unfit for milling, it was far from a calamity. In fact, the scare and its effects in the way of flour trade demoralization and losses suffered by many who bought wheat speculatively, more nearly resulted in a calamity than did the loss to the crop.

In August of 1907, the records of the signal service bureau show that there was light frosts in localities in northern Minnesota and North Dakota on the night of the 1st, 2nd, and 3rd; heavy frost in places on the 19th and 20th, and a killing frost on the 21st. Manitoba and Saskatchewan of course had frosts during August. Nowhere, however, were the frosts general; they touched here and there; some localities escaped entirely, while in others the wheat was injured all the way from slightly to seriously. Even as far south as northern South Dakota the frosts of the first week in August slightly

injured some wheat. This was not discovered, however, until the grain was marketed. In Canada the crop was so late, due to an abnormally late spring, that the frosts of the latter part of August destroyed millions of bushels of wheat by checking the development so that it never matured. Probably 25 per cent. of the crop of Manitoba and Saskatchewan was fit only for feed.

Just how abnormal the season was can be understood when it is considered that the crop was damaged in the vicinity of Indian Head, Saskatchewan, where there had been no frost damage for twenty years.

It is impossible to estimate the loss to the wheat grower as a result of frost in August, 1907; for, as a result of the early frosts, the price of wheat was advanced to a considerably higher level than the damage warranted.

When the first frost occurred in North Dakota in August, 1907, the market was declining. In fact, it was experiencing a violent reaction from the great "green bug" bull market of May, during which Chicago September wheat had advanced to $1.04⅝. By August 1st it had declined to 91 cents, and by the 12th to 83⅜ cents. Wheat had been declining since June 1st, and therefore was in a position where any decided crop damage news would cause a quick reversal; and reports of frosts in the spring wheat country had this effect. Another great bull market was started, and within sixty days prices had advanced approximately 20 cents. This advance, however, was purely a speculative one, due to covering by those who had sold short and to buying by the bulls—purely speculative, because prices promptly declined again, losing in thirty days all they had gained in sixty.

CHAPTER XXI.

PESTS AND CALAMITIES (Concluded).

Insect Enemies of Growing Wheat—Grain Aphis or "Green Bug" and a Great Bull Market—Hessian Fly—Chinch Bug.

In the spring of 1907 many people throughout America and Europe heard of the "Green Bug" for the first time; and while there were few members of the grain trade who had a clear perception of what the insect might do to the growing wheat, the world was not long left in doubt as to what it could do to the market.

It is a peculiar feature of the wheat market (that is, of the traders)—like the early-day sheriff of the Wild West, who would shoot first and then ask questions—that it is often alarmed, then stampeded and it carries prices up ten, fifteen or twenty cents, pauses and asks questions about damages. And then, nine times out of ten, it gradually works back where it started from. The inclination is to anticipate damage, and the scare is usually greater than the reality.

This was what happened in the spring of 1907. Damage reports began to come from Texas in February, and the reports said the fields were alive with green bugs. It was a mild winter in the Southwest and also a dry one. A little later damage reports came from Oklahoma, and gradually the wheat fields farther north, in northern Oklahoma and southern Kansas, became affected. There was no question about there being innumerable green bugs, nor that the wheat fields of Texas and parts of Oklahoma had suffered some damage. But

owing to the drouth the grain was backward and grew very slowly; and the percentage of damage that was due to drouth was uncertain.

In the matter of weather it was an abnormal season all around. During February the temperature was above normal, and in March there were a few days of summer temperature, 95 degrees in the shade in southern Kansas and 102 in Oklahoma. Then it turned cold, but continued dry. The green bugs meanwhile increased in numbers; and the situation was now attracting general attention. Grain commission houses sent men in greater number than ever before to report on the conditions; and their messages and letters became a feature of the daily grain trade news both in America and the markets of Europe. Europe was particularly interested, because of great crop damage in Hungary, Germany and Russia.

In April it was still dry in the Southwest, but cool; and then it turned cold and there was even frost in Kansas. The green bugs were now reported in the fields of northern Kansas, and still the market did not "catch fire." There were many skeptics in the grain trade, and the public read, but would not believe—not yet. In Chicago, however, there were several commission houses with well-established news agencies, and the daily papers and the trade journals were never for a day permitted to run short of crop damage copy. Most of the crop inspectors who visited the Southwest headed for one particular county in Oklahoma, where the crop was killed early, and then to a spot in southern Kansas where the crop had also been greatly damaged. The result was that sensational damage reports continued to come from the Southwest. Furthermore, it was now argued by the

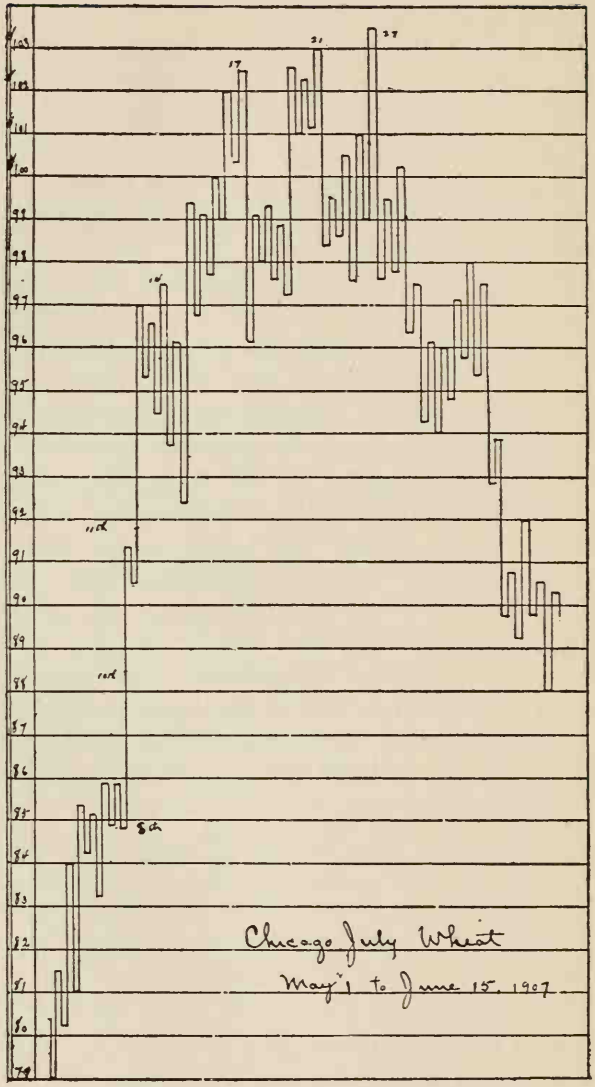
bulls that the green bug would "kill the crop of northern Kansas, as it had that of Texas, Oklahoma and southern Kansas; and then take the crop of Nebraska,—and why not the spring wheat crop of Minnesota and the Dakotas also?"

No one could tell them why not, for nobody knew. In fact, the bugs did follow this programme in spreading but not in damaging the crops.

Even the vast amount of sensational matter circulated, combined with the efforts of several big commission houses, failed to materially advance prices during April. By May 1st Chicago July wheat was 79 cents; and about this time the Secretary of Agriculture, in an interview in a Chicago paper, said that there was too much apprehension regarding the crops, and that his reports indicated a good yield. But on May 10th the report of his department was issued, giving the condition on May 1st. The report estimated that a large area of winter wheat had been abandoned; that is, given up to other crops.

Now the market did "catch fire". The bulls seized upon this with eagerness and wildly began buying wheat. The report was issued fifteen minutes before the market closed, but in the last ten minutes the price advanced sharply.

The dogs of war had now been loosed. Nothing could stop the mad, wild rush of speculative excitement, led by one of the greatest of the Chicago houses. Millions of bushels of wheat were as nothing, and the price, under such buying bounded upward like an escaped balloon. The wave of speculation spread from the Rocky Mountains to the Atlantic, jumped across with the flash of the cable and raged in all European markets. Chicago was the center of the world, and the trade in the pit had never been equaled.


Chicago July Wheat
May 1 to June 15. 1907

In seven days the price had advanced some 15 cents. One of the greatest advances, with the exception of a time of an actual corner, probably in the history of the market was on Monday, May 13th. The price opened 2½ cents higher than it closed on Saturday, and then advanced 4 cents more. It broke back 3 cents before the close of the day; but a 7-cent advance in wheat in one day is a very remarkable occurrence. Chicago July wheat advanced from 79 cents about May 1st to $1.03 about the 22nd. By June 15th it had declined to 88 cents, as the result of the leaders—those who had worked up the wild speculation—selling out their wheat.

DAMAGE DONE BY THE GREEN BUGS.

The grain trade, or that part of it which was interested in prices more than in grain, had "shot first", but now it left others to ask questions. It had had its scare; a bull market had been accomplished; the green bug had served its purpose—it mattered not now whether any damage had been done.

The amount of damage actually done by the green bugs is a matter of dispute. The crop of Texas was almost totally destroyed by the insects, though drouth was also a factor. The crop of Oklahoma was also seriously damaged, but drouth unquestionably was largely responsible for the loss. Kansas raised a good crop, estimated by the State Board of Agriculture at 75 million bushels. A full crop would have been 90 million. Unquestionably 75 million is too high; the crop was probably 60 million, while the big carry-over from the previous crop gave the impression of a heavier yield. But when the adverse season is considered,—the drouth, early heat, later frost, and little really good "growing"

weather,—it seems reasonable to believe that the green bug was a factor in the shortage.

THE SPRING GRAIN-APHIS OR "GREEN BUG."

(Toxoptera graminum.)

The Bureau of Entomology, United States Department of Agriculture, has published some information on the green bug; and in a bulletin issued in 1907, F. M. Webster, in charge of plant insect investigation, says:

When first met with by the writer, in 1884, the insect in question was not at all injurious, and it was more than five years later that it was again encountered —this time as a serious pest. This was the outbreak of 1890, which proved so disastrous to wheat and oats over a section of country extending from Texas to northern Missouri, through southern Illinois and Indiana to eastern Kentucky and Tennessee. Oats were destroyed as far north as Franklin, Ind., latitude 39° 30′. Though quite abundant at times, this aphis did not again cause serious injury until in 1900, when the Southwest again suffered an outbreak, which, while even more serious in Texas than was the one in 1890 did not extend so far northward.

Regarding the rapidity of increase of the green bug, this writer says:

In experiments with a winged female in April, in Indiana, the writer obtained 37 offspring within the period of eighteen days, and at the end of this time some of her first born were themselves grandmothers. From the writer's experience with allied species it is probable that the wingless female is much more prolific than the winged female, so that it would be entirely within reason to suppose that a wingless mother would be capable of producing at least double the number of young mentioned within a slightly more extended period of time.

The green bug will breed freely in temperatures ranging from 100° F. down to below 32°. As the young mature in eight days and themselves begin to give birth to young, it will be seen that an exceptionally mild winter followed by an abnormally cold spring offers the best possible conditions for the excessive increase of the pest, which would ordinarily begin breeding only in spring, and from the eggs.

Unfortunately the parasitic wasp — as with the other beneficial insects—is active only while the temperature is above 56° F., or at least 25 degrees above that at which the green bug breeds freely; and herein is the whole secret of the irregular disastrous outbreaks of the green bug in grain fields. As accounting for the outbreak this year (1907), the green bug has had a whole winter and the following late spring in which to breed and multiply unmolested, and it accomplished its principal damage, as in Texas and southern Oklahoma, before it was warm enough for the parasite to increase sufficiently to overcome it.

THE HESSIAN FLY.

It has been estimated that the minimum annual damage due to the Hessian fly is about 10 per cent. of the crop in the chief wheat-growing states. However this may be, great damage in certain localities is not infrequent, and even a total loss of crop sometimes occurs. The Hessian fly is distinctively a wheat insect, although it also breeds in other grain.

Prof. E. A. Popenoe, of the Agricultural college at Manhattan, Kansas, writes of it as follows:

The adult Hessian fly will scarcely attract the attention of the ordinary observer, and to recognize it in the field even when comparatively abundant will require the use of a sweeping-net for its capture, and a careful discrimination of this minute insect from a number of others, most of them of no importance, that will be taken at the same time. The grower who desires to see the adult should gather some of the infested wheat, with a

quantity of earth about the roots, and place it in a box with a glass, or screen of fine mesh, for a cover. If life conditions are observed, the flies will in due time escape from the wheat, and will be seen to be small, slender, very delicate two-winged gnats, of smoky-black color, the legs and feelers long and slender, the wings narrow, dusky, with lighter bases. The females are distinguished, aside from minute structural characters, by the heavier abdomen, which shows lighter color in the incisions and underneath.

It is with the destructive larvae stage of the insect, however, that the grower is concerned, and during the period of larval existence the insect may be found under the sheath of the leaf, in the fall, near the crown of the plant, and in the spring, next the stalk, at a joint above ground, where it has made its way in each case from eggs deposited by the female on the blade of the leaf above. In the autumn attack, if the plant be early infested, the result may be the death of the seedling before stooling; if the attack be later, the plant may form the stool before the death of the central crown, and under favorable circumstances the laterals will maintain the stand in the field.

There are two distinct broods of the insect, the first of which, numbered as to its relation to the individual plant, attacks the newly grown plants in fall, the second the stalking plant the following spring. The insects of the second brood remain during summer as flaxseeds in the stalk or the stubble.

C. S. Marlatt, M. S., of the U. S. Department of Agriculture, writes of the Hessian fly:

The fall brood works very near or at the surface of the ground. The spring brood usually develops in the lower joints of the wheat, commonly so near the ground as to be left in the stubble on harvesting. With spring wheat the attack is sometimes just at the surface of the ground, as in the case of the fall brood. The adults from the winter-over flaxseed puparia emerge

during April and May, most numerously before the middle of the latter month. The adults of the important fall brood emerge chiefly during September.

There is a supplemental spring brood following the main one and a supplemental fall brood preceding the main one. These supplemental broods are, as a rule, comparatively unimportant. Most of the individuals of the spring and fall broods go through the course of development first indicated. Under any favorable weather conditions the supplemental fall brood may become a very important one, as illustrated by the season of 1899-1900 in the Ohio valley.

The first indication in the fall of the presence of the fly in wheat is the much darker color of the leaves and the tendency to stool out rather freely. This is very noticeable, and gives the wheat for the time being a very healthy appearance. The leaves are also broader, but the upright central stems are wanting, having been killed by the fly. Later, the infested plants turn yellow or brown and die in part or altogether. The spring brood of larvae attacks tillers or laterals that have escaped the fall broods, dwarfing the stems and weakening them so that they usually fall before ripening and cannot be successfully harvested.

The Hessian fly in the larval or pupal periods is subject to the attacks of important natural parasites—small four-winged flies which develop within the bodies of their hosts. There are several native parasites, and in Europe there are many others, one of which is remarkably prolific, and the department has attempted its artificial introduction into this country. This species, "Entedon epigonus", has been liberated in several states, and seems to have gained a foothold, and considerable good may be expected from it. In general the parasites are effective only in limiting damages and are useful where other preventatives are neglected, but can never take the place of active measures where perfect immunity is desired. It is practically impossible to save a field once severely attacked by this fly, and under such circum-

stances it is better to plow the wheat under deeply and plant to corn or other spring crop.

THE CHINCH BUG.

The following description and account of several insect enemies of growing grain is taken from the writings of Mr. Marlatt:

The chinch bug is certainly responsible for as great annual losses to farm crops as any other injurious species of insect known, and it is very improbable that any other species causes anything like the damage that is chargeable to this pest. This is due to its wide distribution, its prevalence more or less every year, the enormous multiplication in favorable seasons, and to the fact that it attacks all the cereals and most forage-plants. The losses caused by it vary greatly in different years, but are always experienced more or less in some locality or other. These losses may often amount to a very large percentage of the wheat and other cereal crops, and also later of the corn crop, and throughout the season of various forage crops. These losses for single states in one season have been estimated at from 18 to 20 millions of dollars, and for single years throughout its range at above 100 million dollars.

The important natural agencies responsible for the abundance or scarcity of this insect are unfavorable climatic conditions and the various diseases induced thereby. The chinch bug is notably an accompaniment of drouth, and very rarely if ever is serious injury caused by it in other than dry seasons. Wet weather is very prejudicial to it and develops various fungous diseases, which, as a rule, very promptly result in its extermination for the season.

The chinch bug is a native insect, originally subsisting on various wild grasses in the Mississippi valley and throughout its range. On this continent it is widely distributed. Over much of this area it is not often very injurious, and the chief losses occasioned by

it are in the Ohio and upper Mississippi valleys and Lake region, and, to a less extent, northward throughout the Alleghany region, New England and Nova Scotia.

THE WHEAT-MIDGE.

The adult wheat-midge is a minute gnat or midge, not exceeding one-tenth of an inch in length, and varying in color from orange to yellow, but tarnished or slightly smoky tinged on the back above the wings.

The injury occasioned by this insect to wheat and allied grain is done by its orange yellow larvae or maggots to the forming embryos in the wheat heads. The milky juice is extracted by these larvae from the young kernels without any apparent gnawing of the surface, causing the grain to shrivel and the heads to blight and to be imperfectly filled. On occasions of unusual outbreaks of this insect the crop is sometimes completely ruined, and occasionally the losses over whole states have averaged from two-thirds to three-fourths of the entire yield, or amounting to many millions of dollars. Damage to this extent is, however, unusual; and the wheat-midge, while ranking as one of the chief insect enemies of the wheat crop, is commonly much less dreaded than the Hessian fly or the chinch bug.

APPENDIX.

(In 1906 the author visited the stock exchanges of London, Paris and Berlin, and wrote the articles that follow, which were syndicated and published in several American papers.)

THE LONDON STOCK EXCHANGE.

I.

One who has walked into the convenient and sometimes splendidly appointed brokers' offices in America, where the quotations are posted on blackboards, and where every possible "aid to speculation" is offered as an inducement to customers—those who are familiar with such conditions will at first be impressed with what seem to be the handicaps that are placed upon speculation and investment trading in securities in London.

By the rules of the Stock Exchange, brokers are not allowed to advertise. The modest announcement on the office windows, "Blank & Co., Stock and Share Brokers," is the conservative extent to which the Exchange permits its members to go. Brokers in London who advertise in the papers or who send market letters to others than their customers, are not members of the Exchange.

In coming to London, I had neglected to secure letters to any members of the Stock Exchange; and so, at first, doubtless encountered the same difficulties that any stranger would in seeking information or to open an account with a broker.

The Stock Exchange is in the commercial and financial district, of which the Bank of England and the Royal Exchange are the precise center—just as Wall Street is New York's financial center. Yet the exchange building is uninviting in appearance, as the Exchange itself is uninviting in reality. No one but members or their clerks are permitted to enter the Exchange, nor is

there any gallery for outsiders. Doorkeepers are stationed outside the different entrances, where, in a small vestibule, there is generally a group of traders awaiting an opportunity to speak to their brokers. The latter are summoned by means of speaking tubes, and the doorkeepers are busy during the session calling out brokers.

The doorkeepers are well trained in the conservatism of the place. They do not know where any brokers' offices may be found nor anything else except that only members are admitted, and that strangers are expected to seek information through the medium of a friend who is acquainted with some broker.

The secretary's office of a commercial organization is usually an unfailing source of information. Not so with the London Stock Exchange. The secretary himself cannot be seen, and his well-trained clerks have but the one reply, "The secretary gives information only to members."

The one thought that outsiders must be excluded, has apparently been so well drilled into the automatic employes of the Exchange as well in clerks in brokers' offices that the impression has gained ground with them that the business is self-existing.

Yet this is no more true of the London Stock Exchange than of the New York Exchange. The patronage of the public maintains the Exchange and the brokers and the thousands of employes just as in any other business. Only the system of treating the public, whose money is needed in the business, has not kept pace with the times as it has in most other lines.

Yet all these formalities melted away as nothing, after I had secured a letter to a broker from a mutual friend on the Baltic Exchange. Then the ease with which things opened, everything but the doors of the Exchange room, seemed an apology for the previous coldness.

The Stock Exchange had its beginning in May, 1697, when an act was passed to limit the number of stock brokers and to regulate their personnel. The act specified that "No person shall act as a broker until licensed by the lord mayor and court of aldermen of the city of London."

Brokers were then forbidden to deal in any article on their own account; and even now brokers are not supposed to trade for their own account.

The London Stock Exchange is a private institution. The building belongs to a proprietary of shareholders, and is managed by an executive body of nine persons, who, in addition to having the entire control over the income and expenditures, have the power of fixing at will the entrance fee and the annual subscription to be paid by members. But they have no authority over the business transacted on the Exchange.

The shareholders have no right beyond a claim for dividends. That is, they are not privileged to enter the Exchange, nor are they eligible to membership except through the ordinary course prescribed for a stranger.

The members of the Exchange are in reality the tenants of the shareholders. The members are bound by their own rules and are managed by a committee, from whose decision there is no appeal.

The membership is about 3,000, and the entrance fee is now 500 guineas, or $2,500. In its membership and management the Exchange differs radically from the New York Stock Exchange. A membership in the latter costs from $55,000 to $80,000, and a member is a member for life, or "on good behavior," or until he sells his seat. In the London Exchange members are re-elected every year; which is an easy way, by not re-electing an undesirable person, of dropping him. It is simpler than expelling him. There is an annual subscription of $150.

When application is made for membership, the committee makes searching inquiries regarding the applicant's general character and credit; and, furthermore, notes his standing in society.

BROKERS AND JOBBERS.

The membership consists almost exclusively of stock jobbers and brokers. The latter execute orders for customers, but do no trading for themselves. However, there are a few members, capitalists, who were formerly either brokers or jobbers, but who, not desiring to con-

tinue in actual business, confine their dealings to their own investments.

The stock jobber is unknown to American exchanges, yet in a way, he is almost identical with the "floor trader" or "scalper" of the American stock and grain exchanges.

The jobber, like the floor trader, stands ready at all times to buy or sell at some price. He is the stock merchant, and in reality constitutes the basis of the market; for without him, there would often be no one to buy from nor to sell to. The price at which the jobbers offer to transact business in any security, is the official market price.

The jobber is not, of course, bound to trade nor to make quotations. Yet when he wishes to retain the connection of a broker, he seldom or never refuses to do so. Having made a price, he is bound by the rules of the Exchange to deal at it. When asked for a quotation on a certain stock, the jobber will give two prices, one at which he will sell and the other at which he will buy. This difference, which may be from one-fourth to one point, is called the jobber's "turn." It is in reality often the jobber's scalping profit, and the public pays it on every trade made. Under certain market conditions, there would be innumerable opportunities for immense profits to the jobbers, at no risk at all.

There is practically no litigation, perhaps absolutely none, arising from transactions between broker and client. While the committee that governs the Exchange does not recognize any dealings made with the public, nevertheless, should any question arise between broker and client, the committee will give the matter a hearing. So fair and impartial have the decisions of the committee always been that, in cases of misunderstanding, the public goes to the committee rather than to carry its troubles to court.

INVESTMENT VS. SPECULATION.

There is a closer line drawn here than in America between investment and speculative accounts. Ample

facilities are offered for speculation, when one once learns about them, and during the last dozen years speculation has largely increased. The majority of brokers' offices have a ticker, so that customers may know at all times what the market is doing; and orders may be given over the telephone as readily as anywhere else.

In proportion to the total amount of business, there are fewer speculative transactions than in New York. On the other hand, there is a much larger percentage of investment trading—buying of securities for permanent investment.

There are brokers here, and some young, progressive houses, too, that do not want speculative accounts. One broker expressed it somewhat after this fashion:

"We don't care for the class of customers that is ringing us up all the time to know how the market is going, or running in six or eight times a day to look at the ticker. Such customers are more bother than their commissions are worth. Now, the kind of clients we want are those who give us an order and then give the market little more attention. They look at their Times in the morning to see the quotations, and are not continually bothering us."

This broker, a young man who had been in business for ten years, said that he had not sustained a single loss from bad accounts. His customers were of the investment class, who purchased securities outright.

There is a much greater variety of securities dealt in on the London Exchange than on the New York. For investment buying, "consols" are in the lead. Then there are colonial stocks, British railways, foreign securities, American and Canadian railways, Indian and foreign railways, a hundred stocks under "miscellaneous," Australian shares, South African shares—a large number, and many others.

In marked contrast with New York, the London Stock Exchange compiles no statistics, nor does the tape show the number of shares dealt in. Another difference in methods or system, is that a settlement is made every day in New York, while the London Exchange has a settlement but twice a month.

THE PARIS STOCK EXCHANGE.

II.

The Stock Exchange or Bourse, of Paris, the exact name of which is "Company of Agents of Change"—Compagnie des Agents des Change—was established during the early part of the eighteenth century. It was organized by a few wealthy and conservative men, in strong contrast to the speculative schemes of Law, and received a charter from the government.

A peculiar feature of the Stock Exchange is that it is entirely under government control. Until a few years ago the membership was limited to sixty. Then it was increased to seventy, which is the present limit. There can be no new member elected until a vacancy is caused by death or dismissal. Applications for membership must be approved by the government before the applicants can be elected. The members are called "Agents de Change."

As already said, the Agents de Change were a conservative set of men. At the present time they are forbidden to speculate or trade for their own account. They are supposed merely to act for the public. Only a few stocks or bonds, principally government, were at first traded in. This, of course, kept the market a narrow one, though comparatively safe. Owing to the limited membership it is not difficult to retain a high standard among the members.

The stock market became too narrow for the public and for others who had a desire to enter into the stock brokerage business. The result was the beginning of an independent exchange, which has developed into a larger institution.

The members of the independent exchange are called "La Coulisse," which, like many French terms, conveys an insinuation hard to interpret. This is a theatrical term, meaning "in the wings." In semi-slang I should say that the Coulisse are hangers-on to the real thing, in which they cannot participate. In fact, the title of the independent exchange indicates this. It is "Syndicat des

banquers en valeurs a terme pres la bourse de Paris." That is, Syndicate of bankers in securities for account (also for cash transaction) "near" the Bourse.

That little word, "near," conveys a world of meaning, when understood. The Exchange of the Coulisse is "near" the Bourse, both literally and figuratively. It is, in fact, on the broad, high porch of the Bourse, in the open air, the "curb" of America. It is "near" to the Bourse also in that the interests of the two exchanges are closely allied, and as the members of each give orders back and forth in the two exchanges. Yet the same stocks are not traded in both exchanges. When a stock is listed in the Bourse, it is withdrawn from the list of the Coulisse.

It is rather a novel sight, on the great porch at the top of the marble steps, to see the solid groups of the Coulisse frantically trading in stocks and mining shares. Imagine several hundred naturally quick and excitable Frenchmen in the pit of the Chicago Board of Trade, or on the floor of the New York Stock Exchange! Of course, nothing can exceed the intensity of the strain and excitement during a wild market on American exchanges; it seems almost tragic to those on the inside. But while, I was told, the French traders become frantic during exciting markets—and one can easily believe it—in an ordinarily active market, the trading impressed me as being somewhat under artificial excitement.

In America the barbarous custom of mobbing strangers when caught by the traders, has nearly vanished. But it is still a rite, not "right," indulged in by the Coulisse. Perhaps the Americans got it from them. If a stranger, lured by curiosity, gets within reach of the Coulisse on the porch, he is maltreated in manner truly barbarous, and he will be fortunate to escape to the street with half his clothes on. This, of course, is great sport for the Coulisse.

This second exchange is a private corporation. It was organized by wealthy men, and has grown in favor. The two exchanges have of late years been inclining toward each other, and it is believed by some will ultimately be consolidated. The Exchange of the Agents de

Change is too limited for the present commercial and financial demands, and two are not desirable. It is therefore probable that the membership of the old one will be increased. Thus the Exchange of the Coulisse will cease to exist.

The hours of the Bourse are from 12 to 3. The Exchange room is divided, by iron railings, into several compartments. One corner is reserved for clerks, who keep records in large books of the stocks traded in for their houses. No record is kept of the total number of transactions. The Exchange is open during trading hours, to visitors, who may enter without a permit. The building is owned by the city and leased to the Agents de Change.

The traders are divided into five groups. One group trades in bonds and stocks for cash accounts only. The others trade in the various stocks and bonds for "term" account, or on margins for speculative account. The latter accounts are settled twice a month, as in London, instead of daily, as in New York. The interest on long stocks is, therefore, less than in New York.

There are some 300 stocks and bonds listed for term trading, and about 500 for cash account. The former include French bonds, colonial bonds, a long list of French bank stocks, several French railways—there are only six big French roads—electric omnibus line stocks of different French cities, and many French industrials.

The foreign list includes many Russians, municipal bonds of different countries, bank stocks, railways, industrial and mining.

For cash account there are many French municipal bonds, tramways, bank, electric companies, industrial, and a good number of miscellaneous stocks.

American stocks are not traded in, but several railroads are quoted over the ticker. The government demands a tax, based on capitalization, on foreign stocks and bonds traded in.

The Coulisse trade in a "variegated" list of stocks, many of which have in their names indications of being "cats and dogs," and yellow ones, at that. Kaffirs, or "Jungles," are among the most active. Mining stocks

are traded in very largely. The Coulisse trade in twice the number of stocks and bonds for cash account that is listed for term account.

One is strongly impressed with the open intimacy between the banks and the Stock Exchange. In a large room just off the Exchange room the principal banks of Paris have little compartments or booths, with a clerk and a telephone. The Exchange and the banks are, therefore, in close communication.

The trading in bank stocks in the open market is another feature of interest by comparison. Banks in America seem a little particular who holds their stock.

The Exchange has direct telephone communication with London, Antwerp and Berlin, and quotations from the stock exchanges of those cities are given over the ticker.

THE BERLIN STOCK EXCHANGE.

III.

Berlin is not only one of the great financial centers of Europe, but a great speculative center as well; and the Stock Exchange is of particular interest to Americans for two reasons. One of these is because of the intimate association of the banks with the Exchange, and the other because a number of American stocks are traded in.

One who comes to Berlin from the conservative West, conservative as regards banks and speculation, is at first shocked, then puzzled to find that all the large banking houses, many of them of international standing and reputation, have representatives on the floor of the Exchange to transact their own and their customers' business.

To fully realize what this means, one must create a parallel case. Such a one might be that of the leading banks of Chicago, Minneapolis, Kansas City and St. Louis, having clerks on the floor of their local grain exchanges trading in the pit for their customers, and scalping the market on the bank's account.

The Stock Exchange has a very large membership, several thousand, but there is no price attached to the

memberships or seats. Any person of good standing, moral and financial, and properly vouched for, is entitled to membership. The organization is maintained by the annual dues, which are dependent upon the number of employes a member has on the floor and the amount of business transacted. Each bank is entitled to a seat.

The larger banks have a considerable force of clerks on the floor. They have desks around the sides of the Exchange room, where a regular stock brokerage business is done. Orders are received here either directly from customers or by telephone or wire. Orders are executed around the bankers' tables or through paid brokers in the pits.

When a bank takes a Stock Exchange account for a customer, it always reserves the right to either execute the order in the regular way, or to take the trade (buy or sell) the stock itself. In other words, it reserves the right to "cross" the trade or to "bucket" it, provided, of course, it is done at the official quotation and the transaction reported to the "sworn brokers."

The banks make this reservation—there is no secret about it, and such frankness is delightful—in order to protect their own interests; to at times prevent violent fluctuations in the market. For instance, a bank may hold a large amount of a certain stock. A customer may also hold a large amount of the same stock. The latter gives the bank an order to sell his stock. But if it is put on the market, a slump may result. The bank may prefer to take this stock itself, at the market price, rather than to have the price depressed.

Again, a bank may have orders to buy say 1,000 shares of a certain stock, and orders from other customers to sell the same stock. The bank is permitted to "cross" these trades at the official price, though the transactions must be reported.

The Stock Exchange of Berlin is a recognized part of the commercial and financial interests of this great center. Yet it is not, like the Paris Stock Exchange, under the patronage of the government. Neither is it in the hands of a board of directors. Its destiny is shaped by the Corporation of Old Merchants and Bankers. This is

an old organization and a close corporation. In fact, it is too close for many business houses that could not gain a membership in it, so a new organization, the Chamber of Commerce, is the result. The latter is a recent organization, and is now supposed to work in harmony with the exclusive Old Merchants and Bankers in directing the financial and commercial interests of Berlin.

REGARDING SPECULATION.

Yet speculation is not regarded with favor by everyone. The agrarians, who only recently added 13 cents a bushel to the import duty on wheat and increased it on many other things in proportion—this busy political power took a fling at the Stock Exchange. For one thing, it passed a bill prohibiting future or term trading in German industrial or mining stocks. They may be traded in for cash only—purchased and sold outright. The agrarians also have had the government represented on the Exchange, in the person of a royal commissioner. Also, there are sixty or more "sworn brokers," appointed by the government, who have places inside a railing in the center of the floor. Their business is to execute orders given them and to make the official quotations on cash stocks each day. The stocks dealt in for cash only are under the control of the "sworn brokers," and only one quotation is made on such stocks each day. All transactions in cash stocks are made at the official price, which is an average one between buying orders and selling orders. The official prices on the different stocks are given out at from 1 o'clock to 1:30, and no trades can be made after the quotation is announced. All who have cash stocks to buy or sell, report to the sworn brokers, giving the price limits, and thus an average is made.

The business done on the exchange is very large, and the list of securities traded in is a long one, consisting of about 2,500. Some of the Americans traded in are the following: Central Pacific; Chicago, Burlington & Quincy; Chicago, Rock Island & Pacific; Denver & Rio Grande; Illinois Central; Long Island railway; Northern Pacific prior lien; Northern Pacific general lien; Penn-

sylvania railway; Southern Pacific, and Baltimore & Ohio. The latter and Canadian Pacific are favorites.

Foreign stocks, when brought into the country, are taxed 3 per cent. All stocks are taxed for each transaction—a stamp tax.

The Stock Exchange has but one settling day a month, as compared with two a month in Paris and London and a daily settlement in New York. The latter is best for the broker and the banker, and the monthly settlement is easiest on the customer.

The hours of trading are from 12 to 1:30 for the cash transactions, and from 12 to 3 for the future or term market.

It is, obviously, to the interest of the Berlin banks that their customers speculate; and that they encourage it was proved after future trading in German industrials was prohibited. The intent of the law was to stop speculative trading, but not investment buying. Yet the banks loaned money on such securities, and thus enabled people who had not the money to trade in them. This the government regarded as avoiding the intent and purpose of the law, so this also was prohibited.

While the government is so watchful in some ways of the people's interests, it is surprising that it overlooks the advantages for manipulation the banks have, due to their privilege of crossing trades and themselves being the purchasers of their customers' securities, when deemed advisable. The banks occupy the position of immense stock brokerage houses with privileges that must be worth millions to them. Yet the attitude of the government, or rather the agrarians, toward speculation in breadstuffs and industrials leads one to suspect that their legislation is for selfish purposes, and this situation does not interest them, or that they do not realize the position of the Stock Exchange and the banks. It is certain, however, that the latter would receive no help from the government if their speculations should lead them into a tight money market with call money at 125 per cent. It is more likely that the bank officials would be sent to prison, for the law means something in Germany.